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Riverside Reservoir Habitat Management Plan

C-05WHA-24

Northeast Resource Area

Canon City District

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHECKLIST FOR PREPARATION AND REVIEW OF HABITAT MANAGEMENT PLANS

State: COLORADO - CO
District: CANON City 05
Resource Area: NorthEAST
Prepared by: A Grant GUNDERSON

HABITAT MANAGEMENT PLAN AREA NAME AND NUMBER	SURNAME	DATE
1. Cooperative Agreement completed	McElderry	6/28/76
2. Preliminary meeting(s) with officials of the State Department of Fish and Game *(or other appropriate cooperators)* to discuss tentative HMP and wildlife objectives	Gunderson	6/1/77
3. Endangered Species Act Compliance Report completed by		
4. HMP draft prepared by	GUNDERSON	6/10/77
5. Reviewed by District Wildlife Specialist	Bridges CDK	5-15-78
6. EAR on draft HMP prepared by	GUNDERSON	6/10/77
7. HMP redrafted based on adopted recommendations *(If appropriate, prepare second copy.)*	Gunderson	1/5/78
Reviewed by District Specialists		
Range		
Wild Horse(s) and Burro(s)		
Lands	Parker	6/24/77
Minerals	Huebschman	7/1/77
Watershed	Wertsbaugh	6/23/77
Forestry	Dossett	6/27/77
Recreation	Sharpe	6-28-77
Cultural	Beardsley	6-20-77
Visual	Sharpe	6-28-77
Fire Management	May	7-6-77
Area Manager	Brandvold	7-14-77
Support *(Chief of Operations)*	Kuth	11/3/77
9. Review of draft by Chief, Resource Management		
10. Final review *(if appropriate)* by State Director		
☐ State Office		
☐ Service Center		
☐ Other *(specify)*		
11. Approved by State wildlife agency authorized officer *(if appropriate)*		
Approved by District Manager	M B Lawson	9-14-78
13. Approval of State Director *(if appropriate)*		

GPO 838 - 505

Form 6620–1 (December 1976)

Riverside Reservoir Habitat Management Plan
Northeast Resource Area
Canon City District

A. Introduction

The Riverside Reservoir Wildlife Habitat Area is located in Weld County along the South Platte River approximately 25 miles southeast of Greeley, Colorado. (See Figure 1. General Location Map) County Road Number 87 (Weld County) forms the eastern boundary of the Wildlife Habitat Area (WHA) to the point of its intersection with Township 4 North, Range 61 West. The remaining portion of the eastern boundary is located along the section line between Sections 4 and 5 and Sections 8 and 9, T. 4 N., R. 61 W. The southern boundary then follows the Riverside Ditch westerly to its head at the South Platte River, thence along the South Platte River to the eastern boundary line of Section 16, T. 4 N., R. 62 W. The eastern boundaries of Sections 4, 9, and 16 form the western boundary of the WHA from this point northward until reaching T. 5 N., R. 62 W. The boundary then proceeds east, following a line between T. 5 N., R. 62 W and T. 4 N., R. 62 W. to a point of juncture with a primitive jeep trail which approximately follows the eastern boundaries of Sections 25 and 36. The boundary follows this road to its intersection with County Road Number 87. (See Figure 2. Specific Location Map)

Approximately 13,940 acres are encompassed within the management area. Of this, 3153 acres (22%) are designated Public Lands administered by the Bureau of Land Management. In 1972, 120 acres of Public Lands were withdrawn by the BLM for a Public Water Reserve to protect springs located on these parcels. Colorado State Land Board Lands within the area total 3910 acres (28%) with the remaining 6877 acres (50%) in private ownership. Public Lands are, for the most part, inundated by Riverside Reservoir* and total some 77% (2760) acres of the 3610 acres of aquatic habitat.

Resource values and management opportunities for the Riverside Reservoir Wildlife Habitat Area were identified through the BLM's land use planning system. The Unit Resource Analysis (URA), which is the basic source of information for the lands and resources in the Pawnee Planning Unit, describes these resource values and management opportunities.

Management objectives based on the URA have been established in the Denver Basin Management Framework Plan (MFP). This document, which is BLM's land use plan for the area, establishes land use guidelines for multiple use and management objectives to be achieved for each class of land use or protection. It also serves to constrain activity plans to allow pursuit of only those objectives contained in the management guidelines.

* Based on acreages computed at high water levels

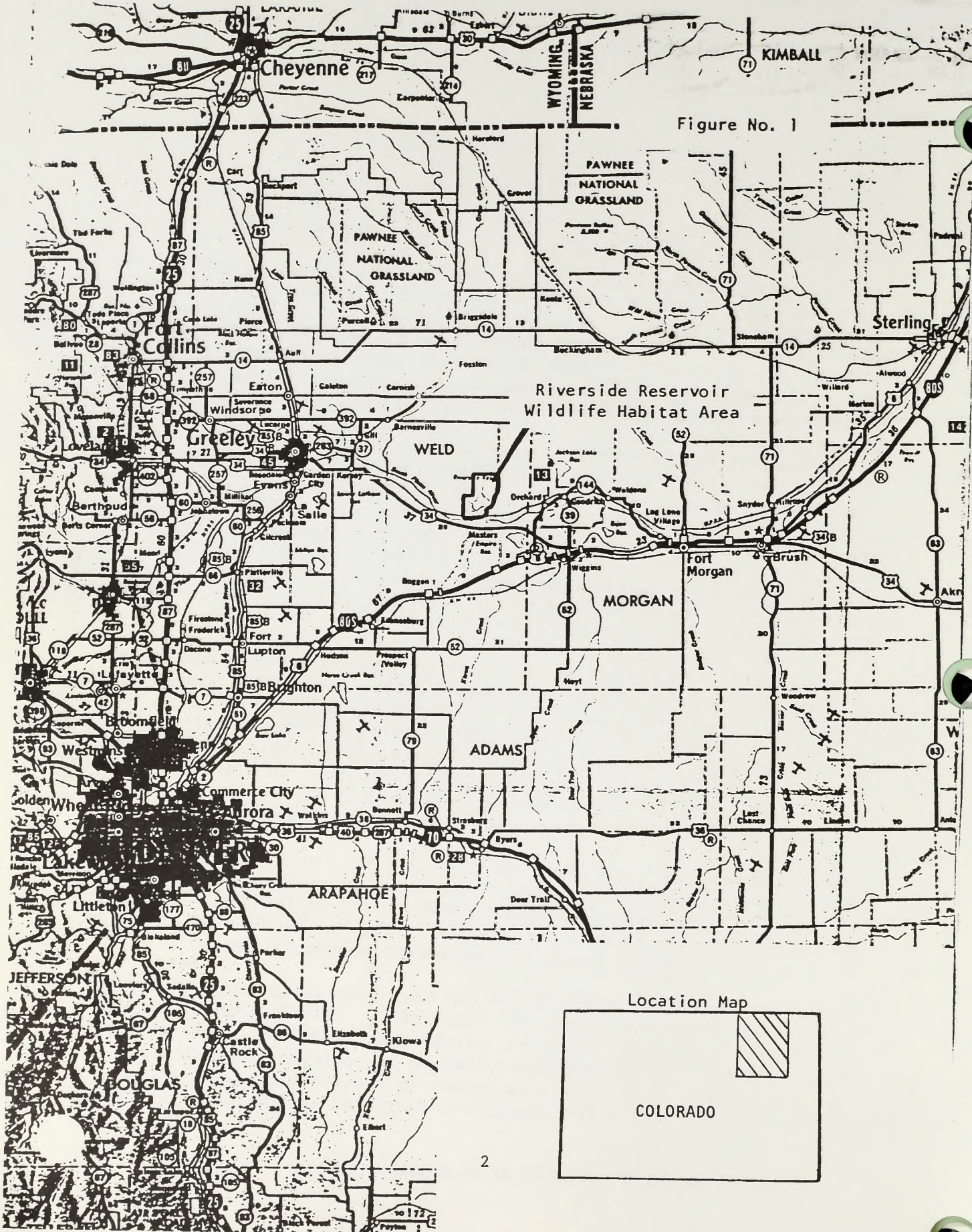
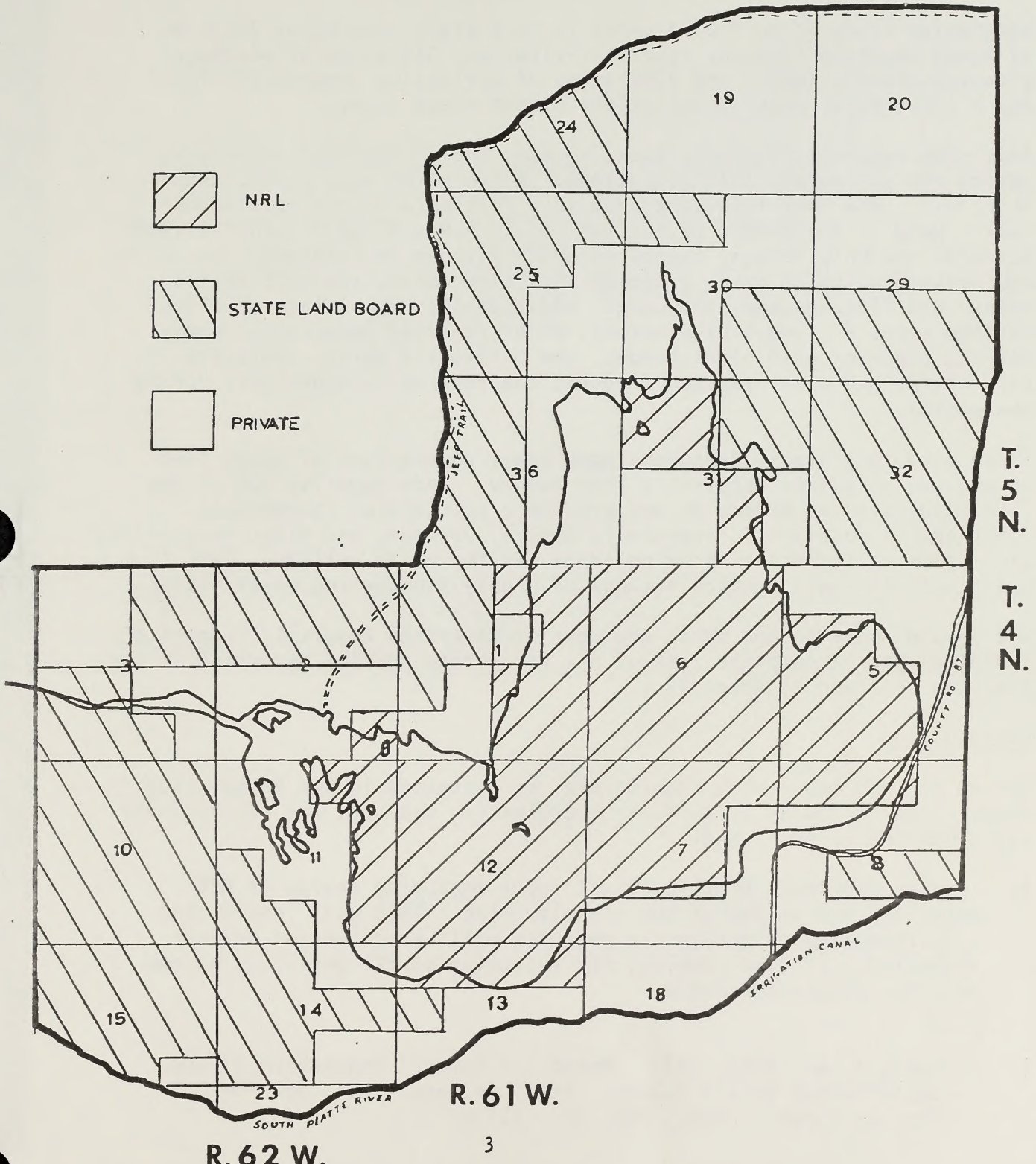

Cheyenne
WYOMING
NEBRASKA
KIMBALL
PAWNEE
NATIONAL
GRASSLAND
Fort
Collins
Greeley
Sterling
Riverside Reservoir
Wildlife Habitat Area
WELD
Fort
Morgan
Brush
MORGAN
ADAMS
Commerce City
Aurora
ARAPAHOE
Littleton
JEFFERSON
DOUGLAS
Location Map
COLORADO

Figure No. 1

RIVERSIDE RESERVOIR WILDLIFE HABITAT AREA

FIGURE #2



The Riverside Reservoir Area is designed as Sub-Unit 15-18 in the URA and MFP documents. A brief description of the area as contained in the Pawnee URA follows:

Pawnee Unit Resource Analysis - Sub-Unit 15-18

Vegetative types 1/ on Public Lands in this tract consist of 78 acres of Rocky Mountain Piedmont reservoir-riparian, 315 acres of sandsage-bluestem prairie (070), and 2760 acres of irrigation reservoir. Table No. 1 illustrates plant associations within these types.

Riverside reservoir supports ducks, geese, and shorebirds, especially during the spring and fall migrations. A few birds nest around the reservoir. The most important area is a five-acre island located on Public Land in the SW¼NE¼ of Section 12, T. 4 N., R. 62 W. This island supports the only nesting colony of white pelican in Colorado. Up to 250 nesting pairs of birds occupied this site during the 1976 nesting season and fledged some 320 young. Additionally, the island provides nesting sites for great blue herons, double-crested cormorants, snowy egrets, black-crowned night herons, and California gulls. Northern bald eagles and other raptors frequent the reservoir, especially during the winter.

These birds are highly dependent upon heavy populations of rough fish to provide an easily accessible food supply. Carp comprise 90% of the fish population at Riverside and provide a substantial forage base. Other nearby reservoirs, especially Empire, Jackson, and Bijou reservoirs, also serve as important foraging areas for the white pelican. Game fish exist only in small numbers because of highly fluctuating water levels.

The upland areas to the north and west of Riverside reservoir support a few antelope. A complete list of all vertebrate species occurring in the area can be found in Appendix I.

Coordination

Bureau of Land Management regulations, as contained in BLM Manual 1609, require the following as in-house coordination measures for all activity plans (an HMP in this case):

1. Interdisciplinary District Staff input including review of MFP decisions and review of the activity plan. This will insure that all protective or mitigative measures will be recognized and coordinated. It also provides for recycling of MFP decisions as new data may become available.

1/ Kuchler, A. W. 1964, 1975. Potential Natural Vegetation of the Conterminous United States. American Geog. Soc., New York. Map and Manual. Spec. Pub. 36. 122 p.

Table No. 1

Vegetative Types

Rocky Mountain Piedmont reservoir-riparian	
Plains cottonwood	*Populus sargentii*
Sandbar or coyote willow	*Salix exigua*
Wild rose	*Rosa* sp.
Cattail	*Typha latifolia*
Bulrush	*Scirpus* sp.
Cocklebur	*Xanthium italicum*
Sandsage - Bluestem (070)	
Sandsage	*Artemisia filifolia*
Sand bluestem	*Andropogon hallii*
Little bluestem	*Andropogon scoparius*
Big bluestem	*Andropogon gerardi*
Blue gramma	*Bouteloua gracilis*
Buffalo grass	*Buchloe dactyloides*
Sandreed	*Calamovilfa longifolia*
Blowout grass	*Redfieldia flexuosa*

2. Use of mitigation and protection actions of those activities impacted by management projects.

3. Use of Environmental Analysis Data to identify conflicts and problems. These must be considered in preparation and approval of this activity plan.

4. All activity plans must use a common general format.

5. Projects that may prove beneficial to other activities must be designed through a coordinated effort.

6. Support Actions and personnel involved in support activities should be fully aware of all needs to be served by a particular project. Coordination between all involved disciplines is necessary to insure this awareness.

In addition to intra-bureau coordination, the development of this HMP has been coordinated with other agencies and interested groups. See Section E. (Coordination with Other Programs/Agencies). In that section coordination with the Colorado Division of Wildlife is described, and implementation of this plan under the authority of the Sikes Act is presented in greater detail.

Public Interest

White pelicans were first observed at Riverside Reservoir in May of 1962 during aerial waterfowl census taking. Later in July, biologists banded 45 of the 60 young hatched at Riverside that year. Previous records of white pelican colonies nesting in Colorado were unknown, and the importance of this colony was noted in the Wilson Bulletin (See Appendix 2). Public interest in the Riverside reservoir colony has grown with various conservation groups expressing their interests in assuring the continued existence of this breeding population in Colorado. Appendix 2 contains pertinent articles from various publications illustrating the unique character of the nesting island.

In 1973 the breeding population of white pelicans was placed on the Colorado Endangered Species list. Favorable conditions have enabled the colony to increase in numbers and productivity to the point that in 1976 the Colorado Division of Wildlife reduced the status to "threatened." Unstable conditions of the nesting island, due to wave and wind action, coupled with the fact that the birds are in a single location highly susceptible to natural disaster, i.e., hailstorms, tornadoes, etc., have made this classification necessary until at least one additional colony in another location can be established. Insurance that the Riverside reservoir population remains viable is, however, the Number 1 priority.

The Division of Wildlife has attempted to establish an additional white pelican colony on an island they constructed in Lower Latham reservoir near Greeley, Colorado. Young pelicans were taken from Riverside just prior to reaching flight capabilities in hopes that they would imprint on the new island. The first transplants were completed in 1974 and again in 1975. To date, the pelicans have not become established on Lower Latham reservoir.

MANAGEMENT OBJECTIVES

B. Management Objectives

The objective of the Denver Basin MFP for Riverside reservoir is to improve through management programs, where feasible, existing habitat for the white pelican. Additional objectives include enhancement of other wildlife values such as other nongame species and waterfowl.

Specific MFP recommendations are outlined and listed as constraints in Section C. In order to meet these objectives and recommendations, the following specific management objectives and goals have been set for individual species.

1. White Pelican

The white pelican has been a breeding resident of Riverside reservoir and Colorado since 1962 when they first nested on an island located in SW¼ of Section 31, T. 5 N., R. 61 W. Erosion resulting from wind and wave action completely inundated this site in 1971. The nesting colony began shifting from that location in 1969, and with complete loss of the island, the entire colony had moved to their present location, an island located on Public Land in the SW¼ of the NE¼, Section 12, T. 4 N., R. 62 W. This island, previously known as Coyote Island, presently supports approximately 250 breeding pair of white pelican and has become known as "Pelican Island." (See Photo No. 1)

The isolated nature of the reservoir during the critical nesting period from April 15 to July 30 has contributed greatly to the colony's success. Ownership patterns have restricted recreational use of the reservoir and virtually eliminated the human disturbance factor that has apparently discouraged establishment of white pelican colonies in other locations within the state. With the growth of the colony, conditions on the island have become crowded, and increasing competition for available space is becoming evident. To further aggravate this condition, active erosion, caused by wind and wave action and flow patterns from the water inlet area, constantly alter conditions on the island.

Erosion of the Pelican Island has chiefly occurred along the north and northeastern shoreline. Photos 2 A and 2 B illustrate this erosion pattern.

Silt and sand removed has fortunately been deposited on the backside of the island, and although the island has moved in a southerly direction across the reservoir, no appreciable loss in size has occurred. Increasing water depths in the direction of movement, however, make inundation imminent.

Actual nesting occurs mainly in two large, sandy, bare areas on the island. (See Photo No. 3) Current erosion patterns indicate that a separation of these two areas may occur if the process goes unretarded. Accelerated erosion could then be expected.

These conditions afford the white pelican only a precarious position as a nesting species at Riverside.

With these factors apparent, the following are objectives for management of the white pelican:

WP No. 1 Perpetually maintain 5-acre white pelican nesting island (Pelican Island).

WP No. 2 Maintain approximately 2½ acres of bare ground on Pelican Island for nesting white pelicans and California gulls until such time as research data may reflect need for change.

WP No. 3 By 1983, increase by at least three weeks the time period that present 5-acre nesting island is surrounded by water.

WP No. 4 Expand suitable nesting habitat for white pelican from present 5 acres to 10 acres by 1983.

WP No. 5 Maintain in perpetuity the current low level of human disturbance which includes no use by the general public and no boating during the pelican's critical use period.

WP No. 6 Increase visitor use from 0 days legal use (by general public) to 2000 visitor days use by 1983.

WP No. 7 Perpetually maintain a rough fish population for a forage base for the white pelican in Riverside reservoir. This objective also benefits other piscivorous birds on the reservoir.

WP No. 8 Determine, by 1979, optimum vegetative composition on Pelican Island for white pelican and other nesting species.

WP No. 9 Determine, by 1980, level of white pelican use on adjacent Eastern Plains reservoirs, including Empire, Jackson, and Bijou reservoirs.

WP No. 10 Identify, by 1979, preference factors influencing nest location and nesting material selection and explore relationships as related to nest productivity.

WP No. 11 Identify, by 1979, population structure of the white pelican colony at Riverside reservoir.

WP No. 12 Identify, by 1979, factors affecting interspecific competition for nesting and foraging locations at Riverside reservoir.

2. Waterbirds - Double-Crested Cormorant, Great Blue Heron, Black-Crowned Night Heron, Snowy Egret, and Cattle Egret

Occurrence of other nesting species on Pelican Island add to the complexity of management systems designed for Riverside reservoir. Cottonwoods and willows are utilized for nesting purposes by these species. Great blue herons and double-crested cormorants generally construct platform nests in the larger plains cottonwoods (Populus sargentii), (Photo No. 4), while the snowy egrets, cattle egrets, and black-crowned night herons nest in the sandbar or coyote willow (Salix exigua),(Photo No. 5). Movement of the shoreline has left some of the trees, especially the cottonwoods, stranded in the reservoir (Photo No. 3). Wave action then exposes the roots, and the trees topple. The rate of erosion has exceeded the rate of new tree growth.

These waterbirds are dependent upon small seepage ponds on the backsides of the reservoir dike (Photo No. 6) for much of their foraging activities. Preliminary observations indicate that as much as 53% of all foraging activity takes place in these marshy wetland areas. Tiger salamanders and crawfish comprise the bulk of prey base outside the major reservoir. Cattle grazing has caused some degradation of these wetland areas. Cormorants often fish the outlet canal for fathead minnows and juvenile yellow perch and suckers.

Cattle egrets nested on Pelican Island for the first time in 1977 establishing a new nesting record for the State of Colorado and a range extension for this species.

Management objectives for the above listed waterbirds are as follows:

WB No. 1 Expand, by 1983, suitable nesting habitat from present 5 acres to 9 acres.

WB No. 2 Improve 50 acres of important wetland foraging areas by 1982.

WB No. 3 Increase, by 1983, the breeding population of snowy egrets from 3 pair to a minimum of 20 pair.*

WB No. 4 Increase, by 1983, the breeding population of great blue herons from 10 pair to at least 30 pair.*

WB No. 5 Increase, by 1983, numbers of breeding black-crowned night herons from 8 pair to 30 pair.*

* Breeding pair based on 1976 breeding survey.

WB No. 6 Increase by 1983, the breeding population of double-crested cormorants from 12 pair to 25 pair.*

WB No. 7 Increase, by 1983, the breeding population of cattle egret from 1 pair (1977 nesting season) to 10 pair.

3. California Gull

Pelican Island at Riverside reservoir is one of only two nesting sites for the California gull in Colorado. Nesting requirements for the gulls are basically the same as those for the white pelican, i.e., open, sandy beaches or flats. This overlap has caused competition for available nesting space and may have contributed to a very poor nesting season for the California gull in 1976. As a result, the management objectives for the California gull are:

Cgl No. 1 Monitor nest selection processes and determine, by 1979, criteria for developing nesting areas suitable to the gulls.

Cgl No. 2 Reduce competition for nesting sites between white pelican and California gulls.

Cgl No. 3 Increase Riverside reservoir population from around 35 breeding pair (1977 season) to 100 pair by 1983.

4. Waterfowl

Riverside reservoir provides important habitat for migratory waterfowl in the Eastern Plains region. Used primarily for resting purposes, some food production does occur and is utilized during the fall migration.

Limited waterfowl nesting occurs, being restricted mainly to small seepage wetland areas and some of the more marshy sites near the inlet canal. Extreme fluctuation of the reservoir prevents the growth of adequate nesting cover near the water.

It has been agreed by the DOW and BLM that waterfowl habitat improvement project will not be pursued at this time. It is believed that public benefits from this type of work will not be obtainable because of access problems with area landowners. Benefits to waterfowl can be expected, though, as objectives for other species are met. For example, by satisfying WB Objective No. 3, an increase in waterfowl nesting cover can be expected. In line with this reasoning, the following is the single waterfowl management objective:

Wf No. 1 As a minimum, maintain present situation for waterfowl at Riverside reservoir.

* Breeding pair based on 1976 breeding survey.

5. Raptors

Significant numbers of raptors including bald eagles, golden eagles, rough-legged hawks, Swainson's hawks, ferruginous hawks, red-tailed hawks, prairie falcons, American kestrels, marsh hawks, and great-horned owls make some use of Riverside reservoir. Reports of peregrine falcon sightings in the area have been fairly common.

Great-horned owls and American kestrels, the only known nesters at Riverside, use the cottonwoods around the perimeter of the reservoir. The area also provides either foraging and/or perching and roosting areas for the other species.

The following management objective is designed to increase raptor habitat at Riverside:

Rpt No. 1 Create an additional 20 acres of raptor nesting, perching, and roosting sites around reservoir by 1983.

6. Antelope

Pronghorn antelope occur only sporadically on the upland grasslands around Riverside reservoir. Antelope have been observed watering in the reservoir, but generally only during the higher water levels. As water levels drop, it becomes necessary to cross large stretches of sandy beach-like areas, making antelope use unlikely. Upland Public Lands are extremely limited, and forage improvement projects would be insignificant. For this purpose the only management objective for antelope is:

A No. 1 Perpetually maintain present antelope migration and movement patterns around Riverside reservoir.

7. General Nongame

Much of the detailed data needed to set specific management objectives for many of the nongame species is lacking. Habitat requirements are not fully understood for many species of reptiles and amphibians or for small nongame mammals. Most of the planned project work will be within the reservoir and has minimal impacts on these species. As more information is gathered, it may become possible to develop additional management objectives. It is possible, however, to establish some general objectives which are:

Gng No. 1 Identify by 1982, specific habitat requirements for reptiles, amphibians, and other general nongame species.

Gng No. 2 Perpetually maintain all important nongame use areas. These include seepage ponds used by turtles, salamanders, etc., small mammal concentration areas, trees used by cavity nesters, etc.

Gng No. 3 Provide a minimum of 30 additional nesting sites for various species of small cavity nesting birds by 1983.

8. Fisheries

Opportunities for development of a sport fisheries at Riverside reservoir are extremely limited at this time. Fluctuating water levels and near drainage of the reservoir create unfavorable conditions for most sport fish. Past attempts at stocking have had limited success. Drawdown in the fall of 1976 revealed the presence of a few northern pike and walleye. The great majority of the fish population, however, consisted of rough fish.

Stocking programs to provide sport fishing opportunities would increase human activities which are highly detrimental to the white pelican. For this reason, the DOW and BLM have agreed that no efforts will be made to develop the sport fisheries at Riverside reservoir. An indirect objective for fisheries is contained in WP Objective No. 7, which requires the maintenance of a rough fish population in the reservoir as a forage base for white pelican and other water birds.

PHOTO NO. 4

Great blue heron and double-crested cormorant nests in cottonwood trees
Pelican Island

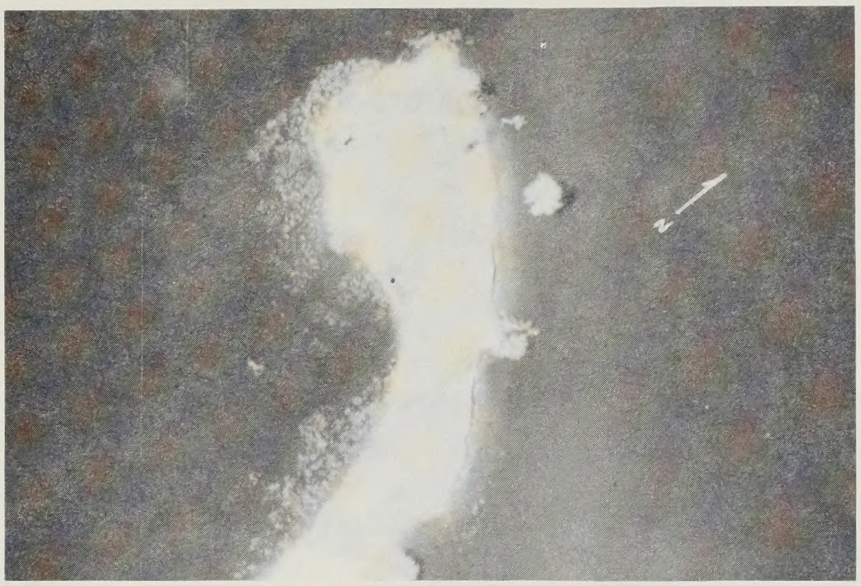
PHOTO NO. 5

Willows on Pelican Island with snowy egret and black-crowned night heron nests

PHOTO NO. 1

General View of Pelican Island

PHOTO NO. 2 A

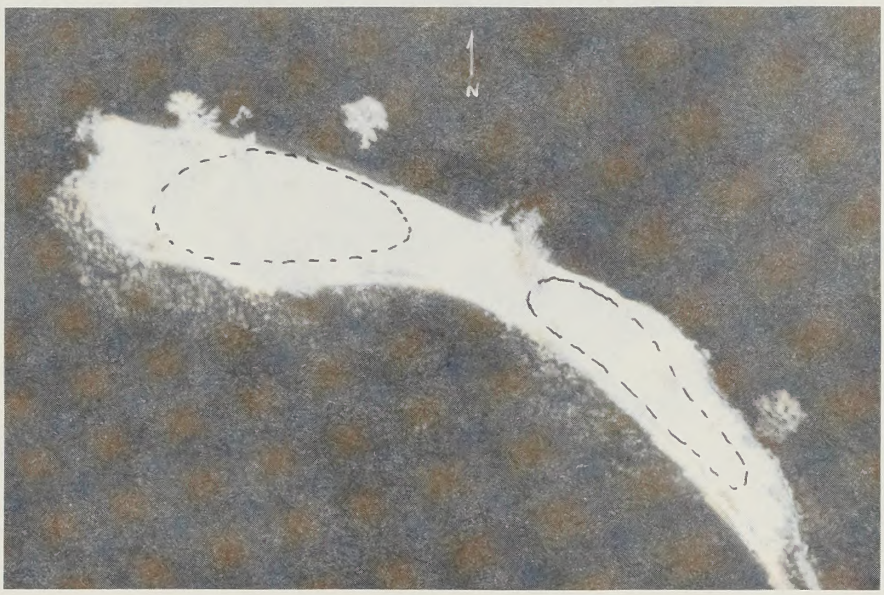


Erosion of north and northeastern shoreline
(Note stranded trees in reservoir)
Photo date 3/24/77

PHOTO NO. 2 B

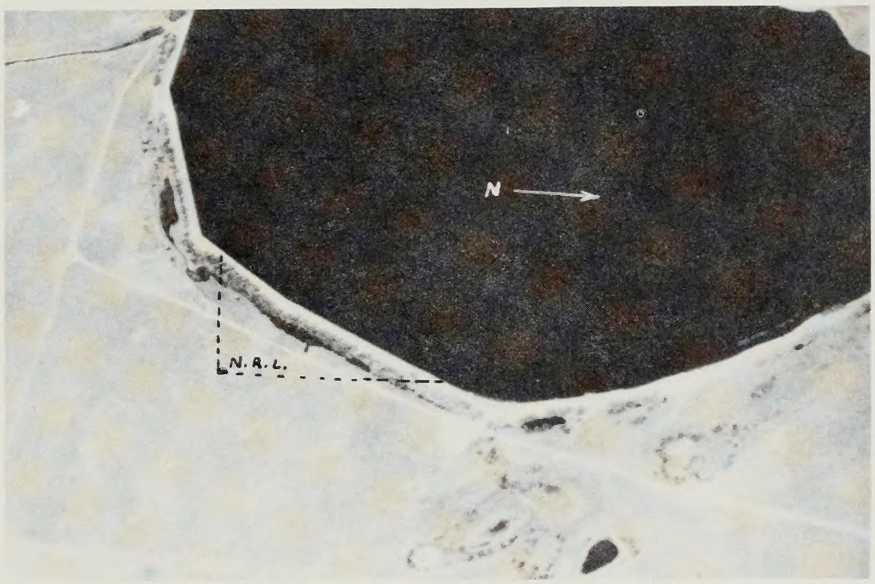
Active erosion of northeastern shoreline
Photo date 3/23/77

PHOTO NO. 3



White pelican primary nesting concentration areas
Pelican Island

PHOTO NO. 6



Seepage ponds located on east side of Riverside Reservoir
National Resource Lands outside the reservoir are sketched in.

CONSTRAINTS

C. Constraints

The management objectives and recommendations developed through this document are based upon the objectives of the Denver Basin Management Framework Plan (MFP). This plan, as previously described, evaluated the various resource values and potentials and resolved conflicts between those resources. Decisions made were based upon recommendations made by resource specialists, other governmental agencies such as the Division of Wildlife, and the general public. This document limits the types of activities to be undertaken at Riverside Reservoir Sub-Unit 15-18 and provides the guidelines for the Habitat Management Plan.

The Denver Basin MFP was completed in 1976 and is on file at the Bureau of Land Management's Northeast Area Office, 10200 West 44th Avenue, Wheat Ridge, Colorado.

The following is a synopsis of the MFP decisions for Sub-Unit 15-18:

Denver Basin Management Framework Plan, Sub-Unit 15-18

Multiple Use Analysis

Riverside reservoir was constructed under a BLM right-of-way for irrigation purposes. Other uses can be permitted as long as the irrigation company's interests and improvements are not jeopardized. Part of the area (120 acres) is included in a public water reserve while an additional 205 acres have been applied for by the Colorado Division of Wildlife under the Recreation and Public Purposes Act.

The reservoir is extremely valuable as nesting habitat for the white pelican, a Colorado Threatened species, and other water birds. Thousands of waterfowl also utilize the reservoirs.

Wildlife has recommended intensive management of the reservoir primarily for the white pelican while Recreation suggested intensive use of one area as a public beach and another as an outdoor education area. Surrounding areas are leased for recreational purposes, mainly waterfowl hunting, by private clubs.

The following are the multiple use recommendations reached after consideration of the different potentials:

1. Develop an HMP in cooperation with the Colorado DOW to protect and enhance white pelican nesting and feeding habitat. Secondary objectives would be to enhance waterfowl, small game, and other nongame habitat. A cooperative agreement for management using the developed plan as a guide should follow.

2. Reject, for the present, the Colorado Division of Wildlife R and PP application for the lands on this reservoir.

3. Acquire lands adjacent to Riverside reservoir for wildlife management purposes.

4. The HMP should consider use of the NW¼NE¼ of Section 8, T. 4 N., R. 61 W., as an outdoor classroom area. Local school districts should be made aware of this possible use.

5. Intensive recreational use of any lands on Riverside reservoir will not be considered. Public access should be open and controlled only when white pelicans are not nesting or using the reservoir, i.e., closed to public use from March 1 through October unless otherwise determined in the HMP. Public access should not include the dam face. Public use of dam and improvements should not be encouraged.

6. Livestock grazing use of adjacent Public Lands should not be allowed. These lands should be fenced and marked.

7. The HMP should address boating on the reservoir and its relation to the primary objective of enhancing conditions for the white pelican colony.

8. The Riverside HMP will become part of an overall management plan for Riverside, Jackson, Empire, and Bijou reservoirs as well as nearby portions of the South Platte River.

PLANNED ACTIONS

D. Planned Actions

1. Species Management

The Division of Wildlife has the responsibility for management of the white pelican colony. It is anticipated in their efforts to establish at least one additional colony that it will be necessary to capture and transplant additional immature white pelicans. Presently the only suitable location is Lower Latham reservoir, but in the future additional sites may become available.

Banding of young pelicans began in 1962; at this time and until 1974, attempts were made to band all young produced each year. In 1975 the banding program switched to a program of banding only a portion of the young but using large, numbered blue bands. These bands and numbers are visible at a distance and are designed to provide case histories for individual birds. This program is scheduled to continue on a yearly basis with the numbers of young to be banded being determined each year.

Past activities by DOW to inform the public of the white pelican situation include designation as an endangered species in 1973 and as a threatened species in 1976, featuring them on the 1975 Conservation Stamp for Colorado, inclusion of a picture of the birds in the 1976 waterfowl regulation booklet with a request to help protect this species, and the funding of a 16 mm. movie on threatened and endangered species in Colorado in which the white pelican colony at Riverside reservoir was featured. Continuation of these public education programs will be necessary as public awareness of the colony increases.

2. Habitat Management

In order to accomplish the management objectives developed for Riverside reservoir, the following project work will be necessary. Proposed projects are designed to enhance habitat for the various species discussed in Section B. - Management Objectives. Impacts upon the environment and wildlife species other than target species are discussed in Section F., the Umbrella Environmental Analysis Record (EAR). Mitigation procedures to be utilized to lessen these impacts are also discussed. Cost estimates and manpower needs are covered in Section G.

The listing is arranged according to priority and includes a narrative explaining the purpose for each project. Preceding the narrative are photo references which serve to illustrate location and nature of the project. Appendix No. 4 also contains maps showing project work locations. Management objectives to be served are included in parentheses following the narrative.

Proposed Habitat Management Projects - Riverside Reservoir

1. Pelican Island gabions and jetty (Photo No. 7). Designed to stabilize the island, the gabions will consist of mattress type wire baskets filled with graded gravel type rock laid to break the wave and current action on the island. An alternative to the gabions may be used if engineering studies provide a more feasible method.

   The jetty will be constructed at an angle from the northwest end of Pelican Island and deflect currents that contribute to the movement of soil from the island. (WP No. 1 and WB No. 1)

2. Pelican Island Isolation Project (Photo No. 8). As water levels drop within the reservoir during the early summer, a narrow land bridge forms on the western side of the island connecting it with dry land. In normal years this level does not occur until after the young pelicans are fledged. During the nesting season of 1976, water levels were lowered at an earlier date while young, unfledged pelicans were on the island. This situation could allow mammalian predators access to the pelican colony. Excavation through the narrow sand ridge to construct a barrier approximately 25 feet wide by 8 feet deep would create an effective barrier to these predators, mainly coyotes. (WP No. 3)

3. Heron Peninsula Isolation Project (Photo No. 9). Excavation through the narrow peninsula to the north of Pelican Island will isolate the southern end of the peninsula, effectively creating an island. White pelicans have made previous attempts to nest on this peninsula, but dropping water levels have allowed predation, and nests were abandoned. A black-crowned night heron and snowy egret rookery exists in the heavy willow growth on the southwestern edge of the peninsula. Predation has also caused their abandonment of this area in the past few years. It is believed that isolation through excavation of a 30 foot wide channel will provide secure conditions for both white pelicans and other water birds including California gulls. (WP No. 4 and WB No.'s 1, 3, and 6.

4. Cottonwood Planting and Protective Fencing - Pelican Island (Photo No. 10). This project will replace trees lost to erosion and will provide, in the future, nesting sites for double-crested cormorants and great blue herons. Fencing (one-fourth mile) is necessary to protect young trees from livestock grazing and trampling. Livestock are able to reach the island only late in the summer after the birds have left the island. It has been determined that this grazing has helped maintain open areas on the island and is generally beneficial to those species using bare ground nesting areas. (WB No. 1 and WB No. 3 and No. 6)

5. Original Nesting Island Reconstruction (Photos No. 11 and No. 12). The eroded nesting island located on private land, if rebuilt, will

provide an additional nesting site for the white pelican and the California gull. The landowner, the Riverside Irrigation District, has agreed to provide the Bureau of Land Management with an exclusive easement that will make this reconstruction project possible. This project would also include erosion protection structures, possibly gabions, to prevent the wind and wave action from re-inundating the island once reconstructed. (WP No. 4 and Cgl No. 2 and No. 3).

6. Wetland Fencing (Photo No. 13). Approximately 3 miles of fencing is needed to eliminate cattle grazing from marshy, wetland areas around seepage ponds located on the backside of the reservoir dikes. One cattleguard will be necessary on County Road No. 87 on the east side of Riverside reservoir. Fences will be built to antelope specification (BLM Manual 1737). (WB No. 2, Gng No. 2, and A No. 1)

7. North Island Isolation Project (Photo No. 14 and Photo No. 15). This island isolated at high water is also joined to the shore by a land bridge as the water levels are lowered. The bridge formed in this case is no more than 300 yards wide flanked on both sides by fairly deep potholes. Water in these potholes remains even after the main reservoir is nearly dry. Canada geese have nested on the island in the past, but apparently the island does not remain isolated long enough to allow successful nesting by other, later nesting species. Excavation of a 25 foot wide channel through the narrow sand bridge would isolate the island for a longer period of time, possibly allowing use by other species. Because of this configuration of the island (steep sides), the value to white pelicans may be limited. Pelicans at Riverside have demonstrated a preference for gradual sloping beaches although in other locations such as Gunnison Island in Utah, pelicans nest on steep-sided islands. This type of island, however, is suitable to California gulls, and their use of this island would relieve competition on Pelican Island. (WP No. 4, and Cg No. 2 and No. 3)

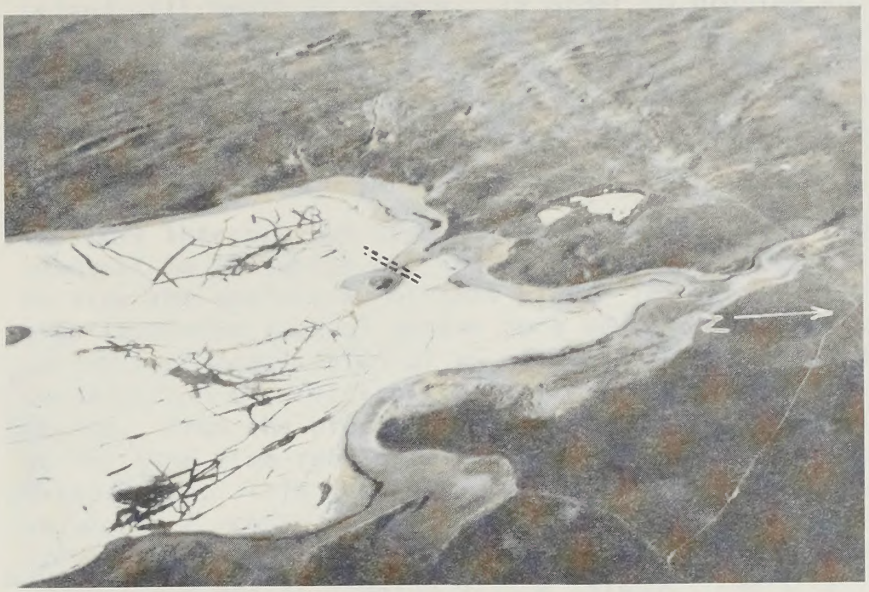
8. Cottonwood and Willow Plantings - Around Reservoir. Present tree growth around most of the reservoir is limited to areas protected from livestock grazing. In areas where trees have become established, almost no young replacement trees are present. These trees, once mature, offer nesting habitat to a variety of birds including raptors, mourning doves, woodpeckers, and numerous species of passerines. Approximately 20 acres is planned for planting. Protective fencing of approximately 5 miles will be necessary until the plantings become well established. (Rpt No. 1 and Gng No. 3)

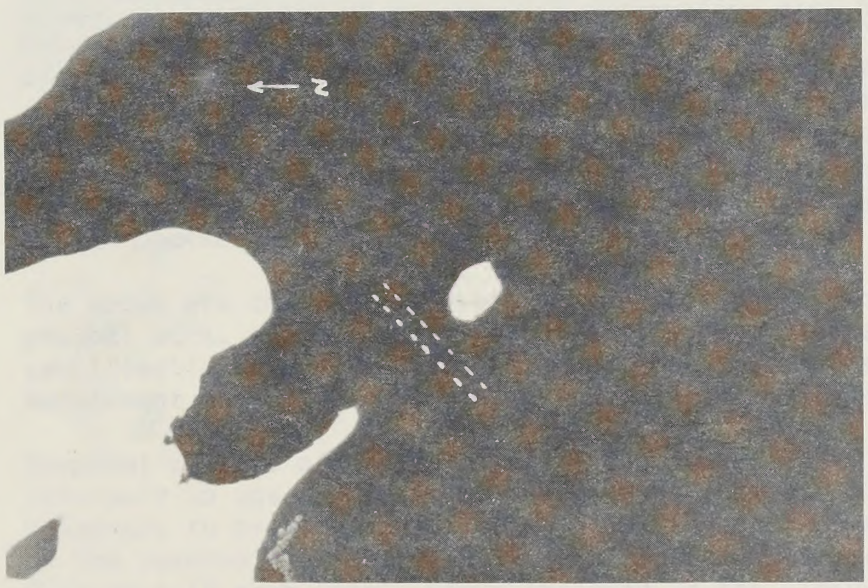
9. Nest Box Placement. Opportunities exist to increase populations of cavity nesters around Riverside reservoir. Placement of varied-sized nest boxes on fence posts and in trees lacking natural cavities will accomplish this. Placement of a minimum of 30 boxes is planned. (Gng No. 3)

PHOTO NO. 13

Location of wetland fencing project

PHOTOS NO. 14 and 15





North Island Isolation Project
Photos illustrate the character of the island at different water levels.
Dotted lines represent the proposed channel through the sand bar.

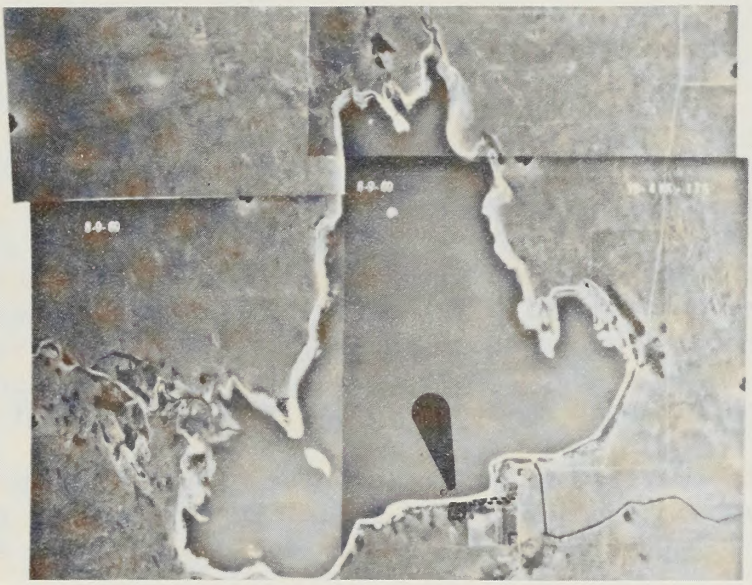
10. Vegetation Manipulation - Pelican Island. It is anticipated that once Pelican Island is stabilized, vegetative composition on the island will begin to change. In order to provide suitable habitat for those species presently nesting there, i. e., white pelican, California gull, great blue heron, black-crowned night heron, double-crested cormorant, and snowy egret, it will be necessary to mechanically alter the vegetation of the island from time to time in the future. (Wp No. 2 and WB No. 1)

11. Visitors Interpretive Center (Photo No. 16). The public has expressed interest in the white pelican at Riverside reservoir and in being able to view the activities of this bird. The present situation at Riverside involving lack of access to a vantage point eliminates this opportunity. Acquisition of an easement to cross private lands and construction of a visitors center will alleviate this problem to some degree. From the proposed location visitors could view the birds but at the same time remain far enough away to maintain a low level of disturbance. This location would also offer a view of the original island once reconstructed. Because of the viewing distance involved, it may be necessary to provide a mounted binocular telescope which would allow better viewing of the island. The site, without use of binoculars, spotting scopes, etc., would provide very limited viewing capabilities and could encourage trespass on areas closer to the island which could cause disturbance of the nesting colony. Besides the birds on the island, many opportunities to get closer views of birds "fishing" or in flight would exist from this location. The facility will include a parking lot and rest rooms. The basic component will consist of an elevated observation deck of sufficient height to see over the reservoir dike. Interpretive displays will also be included. Complete fencing of roadway, parking lot, and around the observation structure is necessary. Public use will be restricted to the area within the fences. Signs indicating restricted areas, reasons for closure, and general information about the management program will be designed and placed during the engineering and design phases of this project. (WP No. 6)

The above are the presently planned actions that involve actual project work. Additionally, other actions are planned that do not specifically involve project work but which are necessary to achieve management objectives. These actions are as follows:

12. Seasonal closure of the majority of the public lands at Riverside reservoir to use and entry by the general public. This closure is necessary to provide and maintain a low level of human interference on the reservoir. Closure will be effective from March 15 to September 15 each year. Lands included in the closure are described as follows:

PHOTO NO. 16



Location of Visitors Interpretive Center

T. 4 N., R. 61 W., 6th P.M.

Section 6:	All	659.35 Ac.
Section 7:	Lots 1, 2, and 3, E½NW¼, NE¼SE¼ N½NE¼, SW¼NE¼, NW¼SE¼	400.23 Ac.
	Except those lands to be included in the visitors interpretive center, approximately 4 Acres	

T. 4 N., R. 62 W., 6th P.M.

Section 1:	Lot 1, SE¼NE¼, SE¼	289.12 Ac.
Section 2:	SE¼SE¼	40.00 Ac.
Section 11:	N½NE¼, SE¼NE¼, E½SE¼	200.00 Ac.
Section 12:	All	640.00 Ac.
Section 13:	N½N½	160.00 Ac.

T. 5 N., R. 61 W., 6th P.M.

Section 31:	Lots 1 and 2, E½NW¼, W½SE¼	240.45 Ac.
	Total acreage to be affected by seasonal closure:	2629.15 Ac.

Access will be allowed for only administrative purposes by the Bureau of Land Management, Division of Wildlife, and the Riverside Irrigation District. This will include cooperators and contractees of the above agencies. A copy of the documents seeking closure and the notice to the Federal Register can be found in Appendix No. 5.

Closure will be coordinated with the Division of Wildlife, and enforcement by DOW will be sought by following procedures outlined to incorporate this closure into their regulations:

All boundaries will be marked with regulatory signs. Appendix No. 6 contains the sign requisition forms which illustrate placement and character of these signs. Objective WP No. 5 is served by this action.

13. Continue resource partitioning study initiated in 1976 through 1978 breeding season. This study, presently being conducted through Colorado State University, Fort Collins, is designed to provide the basic data involved in both the intraspecific and interspecific interactions between birds nesting on Pelican Island. Data gathered from this study will include factors involving nest site and material selection, competition for foraging areas, and nesting productivity. Information on the population structure and life histories of the involved species will also be assessed. Additionally, some indication of vegetative composition on the island that would be considered optimal is anticipated upon completion of this study. This basic information is necessary to make sound decisions regarding the final design of some of the management projects at Riverside. Incorporating these data will provide greater chances that planned projects will succeed. (WP No. 8, No. 10, No. 11, No. 12, and Cgl No. 1)

14. Study of White Pelican Use of Adjacent Eastern Plains Reservoirs. Various reservoirs up to 50 miles from Riverside are used to some degree by foraging white pelicans. Actual use relative to Riverside and each of the other reservoirs is not known. Information to pinpoint specific areas of highest use on each reservoir is also lacking. This study will provide the data necessary to rank each of the reservoirs according to its value as a foraging area for white pelicans. Within each reservoir it will also be possible to assign values to specific areas. As activity plans are developed for the other reservoirs in the area, the information gathered in this study will be used to resolve conflicts between pelican and other uses. (WP No. 9)

15. Cancellation of Grazing Permits. The BLM presently has two grazing leases on lands immediately adjacent to Riverside reservoir. (See Figure No. 3) The lease held by Paul A. Ansley encompasses 28 acres and 10 animal unit months (AUM's). The other lease, held by Floyd I. Ford on 30 acres of Public Land, also consists of 10 AUM's. These leases cover areas of seepage ponds previously identified as extremely valuable to waterbirds and other nongame species of wildlife. These permits will be cancelled two years following implementation. Should fencing be accomplished prior to this date, the lands will be grazed according to the stipulations of the grazing licenses. This action follows the MFP recommendation which states that no livestock grazing on Public Lands adjacent to the reservoir should be allowed. (Recommendation Number 8) (WB No. 2 and Gng No. 2)

16. Acquisition of Public Access. Access for the general public will be signed and identified only in the area of the visitors center. Use by the general public for activities such as boating, fishing, and hunting on the reservoir will be restricted. Management of Riverside in this manner and seasonal closure of Public Lands will effectively create a refuge for waterbirds during the period of their occupancy. (WP No. 5)

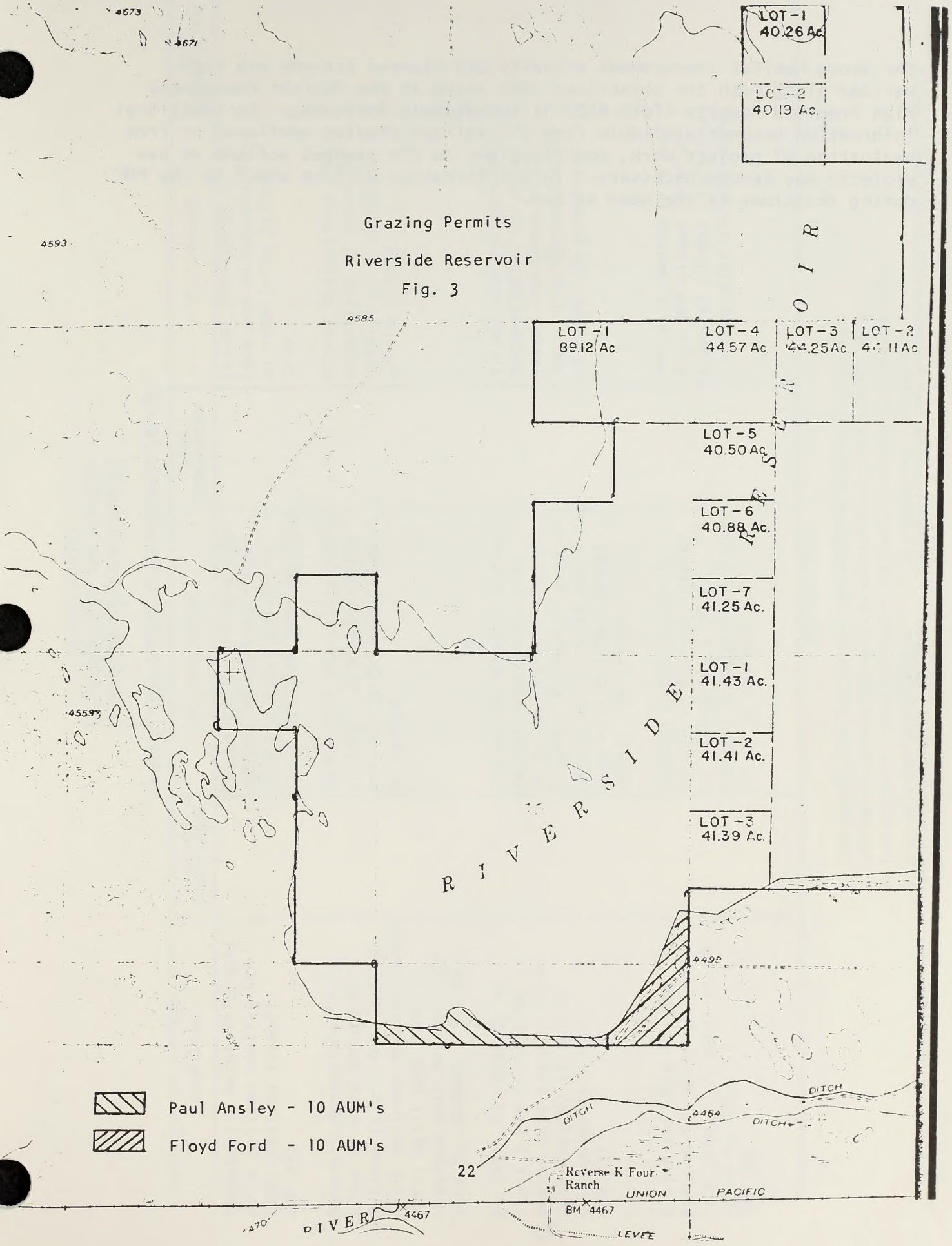
17. Prohibit Rough Fish Control or Fish Stocking Programs in Riverside Reservoir. Maintenance of a rough fish population has been identified as an objective of white pelican management. The stocking of game fish, while not adversely affecting this forage base, would only encourage public use of Riverside reservoir. In order to remain consistent with the other objectives of the white pelican, it would not be in the best interest to encourage public fishing in any form. (WP No. 5 and WP No. 7)

18. Reptile, Amphibian, and General Nongame Inventory. This study is planned to provide baseline data on all species occurring in and around Riverside reservoir and other adjacent Eastern Plains reservoirs. Once the various species and their specific habitat requirements are identified, the information will be used to develop management objectives for these nongame species, especially those that may be unusual or sensitive . (Gng No. 1)

Grazing Permits

Riverside Reservoir

Fig. 3



The above habitat improvement projects and planned actions are summarized along with the objectives they serve in the Habitat Management Plan Progress Reports (Form 6620-3) immediately following. As additional information becomes available from the various studies mentioned or from evaluation of project work, modifications to the planned actions or new projects may become necessary. This information will be added to the HMP during revisions as the need arises.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
Perpetually maintain 5-acre white pelican nesting island (Pelican Island). (WP #1)		Placement of mattress-type gabions on eroding shoreline and construction of jetty to break wave action.		Visual inspection of island and structures for an indefinite period of time.	
Maintain approximately 2½ acres of bare ground on Pelican Island for nesting white pelicans and California gulls until such time as research data may reflect need for change. (WP #2)		Mechanical vegetation manipulation - probably willow control on Pelican Island as needed.		Annual inspections and comparison of existing conditions with photos of the island.	
By 1983, increase by at least 3 weeks the time period that present five-acre nesting island is surrounded by water. (WP #3)		Excavation project through narrow sand bridge that forms on the west side of island. A channel approximately 25 ft. wide and 8 ft. deep will be constructed across the bridge.		Visual observations and documentation of water levels and dates of drying. Also observations of mammalian predators.	
Expand suitable nesting habitat for white pelicans from present 5 acres to 10 acres by 1983. (WP #4)		Isolate Heron Peninsula (north of Pelican Island) by excavating a 30 ft. channel through narrow portions of peninsula.		Annual breeding bird surveys and visual observations of birds' reactions to completed project work.	

INSTRUCTIONS

1. List specific objectives as developed in MFP or as otherwise approved.
2. List specific planned actions to be initiated to meet each specific objective.
3. List scheduled studies and evaluations planned in evaluating accomplishments.
4. Enter date that each objective, or evaluation is accomplished.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
(WP #4 - continued)		Obtain exclusive easement and reconstruct original white pelican nesting island now completely inundated as a result of wind and wave action. Isolate North Island by excavation through land bridge exposed as water levels drop.			
Maintain in perpetuity the current low level of human disturbance which includes no use by the general public and no boating on Riverside Reservoir during the pelican's critical use period.		Acquire public access for only the purpose of observation of waterbirds at Riverside. Observation will be allowed only from a specified area. No public hunting, fishing or boating on the reservoir will be allowed during closed periods. Prohibit fish stocking programs. Such programs would serve to encourage public use even though fishing may be ~~prohibited~~ restricted.		Frequent visits to reservoir by BLM and DOW personnel. Reports by private citizens, etc. Enforcement by Colorado Division of Wildlife personnel may be necessary in some cases.	

INSTRUCTIONS

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UNITED STATES
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HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
(WP #5 - continued)		Seasonal closure of the majority of Public Land at Riverside Reservoir.		Inclusion to Federal Register.	
Increase visitor use from 0 days legal use (by general public) to 2,000 visitor days use by 1983. (WP #6)		Construction of visitors interpretive center on south shore of Riverside Reservoir. Facility will include observation deck, parking area and restrooms.		Documentation of visitor use for one-year periods.	
Perpetually maintain a rough fish population on Riverside Reservoir as a forage base for the white pelican and other piscivorous birds. (WP #7)		Prohibit rough fish control programs.		None needed.	
Determine, by 1979, optimum vegetative composition on Pelican Island for nesting species. (WP #8)		Continue resource partitioning study currently underway by CSU with additional funding by BLM.		Receipt of Final Report and analysis of data.	
Determine, by 1980, the level of white pelican use on adjacent Eastern Plains reservoirs, including		Initiate study to record and document pelican use on these reservoirs. Data will be used to rate both		Receipt of a final report.	

INSTRUCTIONS

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UNITED STATES
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HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
(WP #9 - continued) Jackson, Empire, and Bijou Reservoirs. (WP #9)		(continued) reservoir and specific areas on reservoir as to relative value to white pelicans.			
Identify, by 1979, preference factors influencing nest location and nesting material selection and explore relationships as related to nest productivity. (WP #10)		Continue resource partitioning study currently underway by CSU with additional funding by BLM.		Receipt of a final report.	
Identify, by 1979, population structure of the white pelican colony at Riverside Reservoir. (WP #11)		Continue resource partitioning study currently underway by CSU with additional funding by BLM.		Receipt of a final report.	
Identify, by 1979, factors affecting interspecific competition for nesting and foraging areas at Riverside Reservoir. (WP #12)		Same as above.		Receipt of a final report.	

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GPO 838- 006

Form 6620–3 (December 1976)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
Expand, by 1983, suitable nesting habitat from present 5 acres to 9 acres. (WB #1)		Installation of gabions and jetty to prevent further erosion as discussed in objective WP #1.		Visual inspection of island and structures for indefinite period of time.	
		Heron Peninsula Isolation project.		Visual observation to determine use of project area.	
		Cottonwood plantings and protective fencing on Pelican Island.		Annual inspections on survival of transplants.	
Improve 50 acres of important wetland foraging areas by 1982. (WB #2)		Fence wetland areas (includes placement of one cattleguard on County road).		Completion of project work and livestock trespass checks.	
		Cancel grazing permits on these wetland areas.			

INSTRUCTIONS

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UNITED STATES
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HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
Increase, by 1983, the breeding population of the following waterbirds: 1. Snowy egrets: from 3 pr. to 20 pr. 2. Great blue herons: from 10 pr. to 30 pr. 3. Black-crowned night herons: from 8 pr. to 30 pr. 4. Double-crested cormorants: from 12 pr. to 25 pr. 5. Cattle egret: from 1 pr. to 10 pr. (WB #3 - #6)		Isolation of Heron Peninsula - Habitat for all 5 of these species and former rookeries for at least 2 species exist. Cottonwood plantings on Pelican Island to replace trees lost to erosion. Protective fencing is also necessary.		Annual breeding bird surveys. Annual inspections on survival of transplants.	
Monitor nest selection processes and determine, by 1979, criteria for developing nesting areas suitable for California gulls.		Continue resource partitioning study currently underway with additional funding by BLM.		Receipt of a final report.	
Increase Riverside population of California gulls from 35 breeding pr. to 100 pr. by 1983.		Original nesting island reconstruction - North Island Isolation Project.		Visual observations to determine use by gulls and annual breeding bird surveys.	

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UNITED STATES
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HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
As a minimum, maintain present situation for waterfowl at Riverside Reservoir. (WF #1)		No planned actions necessary.		None	
Create an additional 20 acres of raptor, nesting, perching, and roosting sites around Riverside Reservoir by 1983. (Rpt #1)		Cottonwood and willow plantings with protective fencing - perimeter of the reservoir.		Annual breeding bird surveys and inventories conducted intermittently.	
Perpetually maintain present antelope migration and movement patterns around Riverside. (A #1)		Build any fences to antelope specifications. (BLM Manual 1737)		Completion of project work to specifications.	
Identify, by 1982, specific habitat requirements for reptiles, amphibians, and other general nongame species. (Gng #1)		Reptile, Amphibian, and Other Nongame Inventory.		Receipt of final report and analysis of data.	

INSTRUCTIONS

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HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATIONS	DATE COMPLETED
Perpetually maintain all important nongame use areas. Includes seepage ponds, small mammal concentration areas, and tree cavities. (Gng #2)		Fence wetland areas. Cancel grazing leases on 58 acres of Public Land.		Completion of project work and livestock trespass checks.	
Provide a minimum of 30 additional nesting sites for various species of small cavity nesting birds by 1983. (Gng #3)		Cottonwood and willow plantings around reservoir. Placement of nest boxes on trees and fences.		Annual breeding bird surveys at Riverside.	

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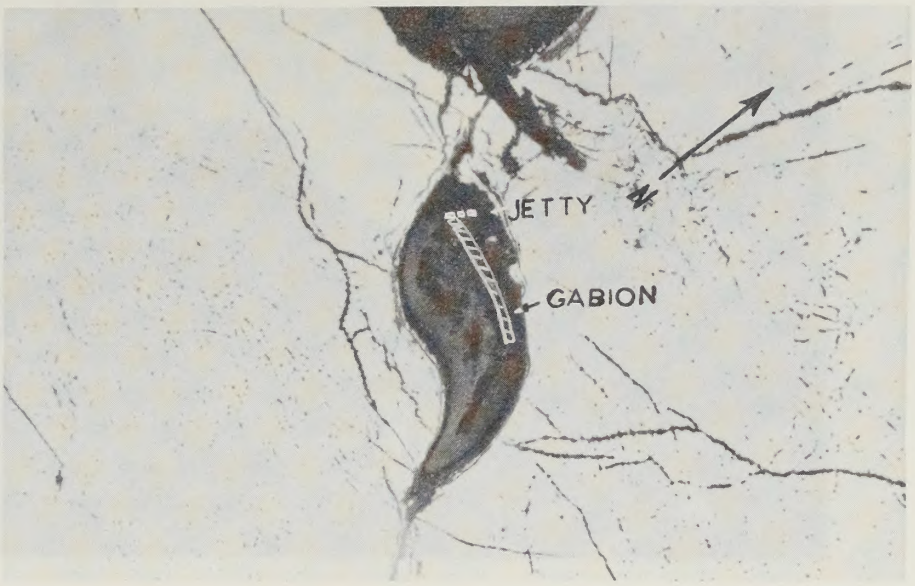
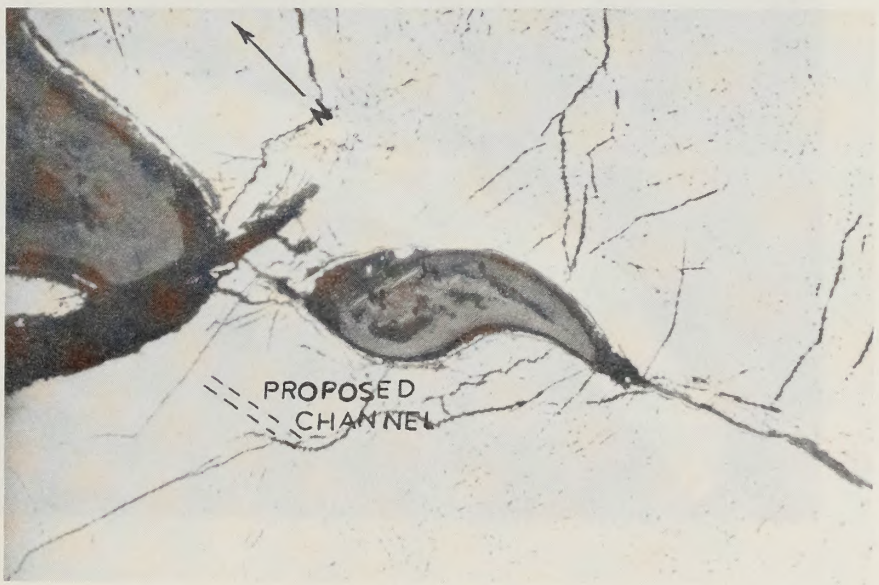
4. Enter date that each objective, a or evaluation is accomplished.

PHOTO NO. 7



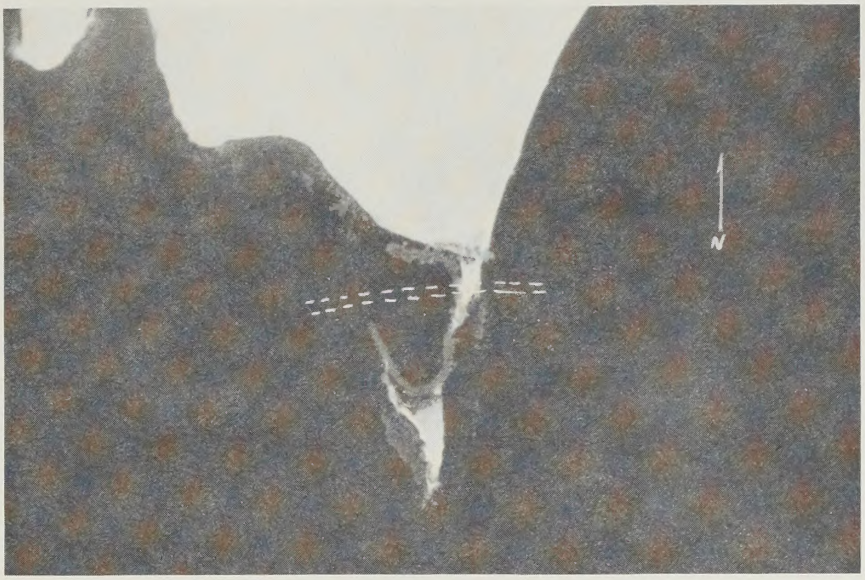
Project location for gabion and jetty structures
Photo taken December 14, 1976, when reservoir was less than full.
Structures are located at high water mark.

PHOTO NO. 8



Location of Pelican Island Isolation Project
Proposed Channel will cut through narrow sandbar exposed at lower water levels.

PHOTO NO. 9



Location of Heron Peninsula Isolation Project.
The dotted white line represents proposed channel.
Photo taken at maximum high water.

PHOTO NO. 10

Cottonwood planting and protective planting locations --
Pelican Island. Fenced areas will receive young trees.
* denotes sites for transplanting larger trees.

PHOTO NO. 11

Original white pelican nesting island
Photo taken December 14, 1976, when water levels were
less than maximum so island was exposed.

PHOTO NO. 12

Approximate location of original nesting island as it appears during high water
Photo taken 3/24/77

COORDINATION WITH OTHER PROGRAMS/AGENCIES

E. Coordination with Other Programs and Agencies

In order to comply with stipulations contained in BLM Manual Section 1609, Activity Plan Coordination, discussed in the introductory section of this HMP, coordination with the other resource values and programs at Riverside reservoir is necessary. Each resource is listed, and on-going programs along with coordination procedures are discussed.

1. Forest Management

The only forest-type products occurring within the Riverside Reservoir HMP area are cottonwood trees. While a limited market does exist for this type of product, the extremely limited supply completely eliminates any consideration of this type program. The HMP management objectives include protection and enhancement of these areas.

2. Livestock Management

Cancellation of the only two livestock grazing leases (Section 15 Leases) at Riverside reservoir is in compliance with the MFP decisions and also with Range Management recommendations of the Denver Basin MFP. The recommendation was to cancel grazing permits because of low returns from grazing fees in relation to high administrative costs connected with processing the lease.

The HMP also identifies the areas covered by grazing leases as intermittent wetland areas. These wetlands are extremely sensitive and easily damaged by livestock grazing. These areas are considered critical habitat to the waterbird colonies at Riverside, and protection from further degradation is an objective of the HMP.

3. Recreation Management

The recommendations of the Denver Basin MFP recommended that (1) consideration be given to the use of a portion of the NW¼NE¼ of Section 8, T. 4 N., R. 61 W., as an outdoor classroom area; (2) no provisions should be made for intensive recreational use of any lands on Riverside reservoir. Public use would not be allowed during nesting season, and public access across the dam or public use of the irrigation improvement structures should not be encouraged; and (3) the HMP address boating and its relation to primary objective for white pelicans.

Currently, no recreation programs exist at Riverside. Some fishing, mainly bank fishing for carp, does occur on the east shoreline. These fisherman must cross private land to fish these areas, and even though the lands are posted, land owners have not enforced the no trespassing laws.

The only point of legal access to the public lies in the area to be considered as an outdoor classroom. County Road 87 intersects this parcel and allows access to the backside of a dike and a seepage pond area. Total upland area is only approximately 15 acres. The limited size of the area and important use by wildlife make this tract unsuitable for an outdoor classroom area. Even limited use on this small tract would have adverse effects on its value as wetland habitat.

Some public hunting has occurred on this parcel in the past. A few people having maps or knowledge of the boundary lines have taken waterfowl and mourning doves. Use has been light and sporadic due to limited public awareness of the tract. Fencing is scheduled for the area, but marking the boundaries as Public Lands is not recommended. This action would encourage heavy recreational use and public access. To reach the reservoir from this location, it would be necessary to cross the dam face.

For the above reasons it has been determined that the best opportunities for recreational experience exist in the area of the visitors interpretive center. The public would have the opportunity to view nesting, feeding, and other activities of the white pelican and other waterbirds.

Much of the private land around Riverside has been leased for hunting purposes by the Riverside Gun Club. Waterfowl hunting occurs mainly on ponds to the north and northeast of the main reservoir. Some hunting from portable blinds at the reservoir edge also occurs early in the season. Boating on Riverside reservoir has generally been restricted to retrieval of waterfowl or setting out decoys by members of this Gun Club. Division of Wildlife Land and Water Use Information brochures have carried regulations restricting boating to within one-fourth mile of Pelican Island on Riverside. These regulations, however, were not applicable since they gave the general public the impression that the rest of the reservoir was open to boating. The only suitable boat launching site on the reservoir is located on private land, and since no legal access exists where boats could be launched, the reservoir has never been open to public boating. In the 1977 brochure these regulations have been omitted.

The absence of boating on Riverside has been an important factor in the establishment of the white pelican colony. The isolation and freedom from harassment by humans is a critical factor affecting the success of the colony. Boating during periods of pelican use is strictly imcompatible with the management objectives for habitat enhancement.

Water levels in the reservoir after the pelican use season are generally too low to provide any boating. Additionally, the Riverside Irrigation District has expressed opposition to any boating because of possible damage to their irrigation improvement structures. For these reasons public boating will not be allowed at Riverside reservoir.

4. Watershed Management and Water Quality

Water supply for Riverside reservoir is obtained from the South Platte River. No opportunities exist for the BLM to significantly improve watershed or water quality for this system.

Some improvement in water quality in seepage ponds and wetland areas can be expected with the elimination of livestock grazing.

5. Wild Horse Management

No wild horses are present.

6. Minerals Development

A mineral report has been prepared for a tract of Public Land at Riverside. A copy of that report is included in Appendix 7. According to the mineral report and USGS maps, the only minerals occurring in the vicinity of Riverside are sodium and oil and gas.

Sodium in the form of sodium nitrate is a leasable mineral that has not undergone any development. Should leasing occur, an Environmental Analysis Report would be prepared, and sensitive areas would be designated for protection.

Oil and gas exploration and production are common on the Eastern Plains of Colorado. The closest known oil and gas field to Riverside reservoir is four miles to the northeast.

An Environmental Analysis Report (Northeast Resource Area Oil and Gas Umbrella Environmental Report No. CO-050-6-70), which describes the impacts of oil and gas exploration and development, has been prepared and includes this area. In that report certain areas were designated as special areas where no leasing or no surface occupancy would be allowed. Table No. 2 lists those lands at Riverside on which these stipulations are applicable.

In addition to the lands covered by these stipulations, another 540 acres of land exists that can be leased for oil and gas exploration. The Umbrella EAR limits periods of activity on these tracts to the months of November, December, January, February, and March. This will eliminate the possibility of disturbing the white pelican nesting colony.

If these leasable lands are subjected to exploration, additional stipulations insuring that all mitigative procedures to prevent environmental degradation can be added as a condition of the drilling permit.

Since no locatable minerals are likely to occur in the area and the leasable program is subject to stipulations designed to protect unique or special areas, it will not be necessary to pursue a protective withdrawal for the lands within the Riverside Reservoir Habitat Management Plan.

A mineral report for the area of seasonal closure will be prepared prior to this closure.

Table No. 2

Summary of Oil and Gas Lease Stipulations

for Lands within the Riverside Reservoir

Habitat Management Area

(From NERA Oil and Gas Umbrella EAR)

NO LEASE

T. 5 N., R. 61 W.
Section 31: Lot 2

T. 4 N., R. 61 W.
Section 5: SW¼
Section 6: Lots 2, 3, 4, 5, 6, 7, SW¼NE¼, SE¼NW¼, E½SW¼, SE¼
Section 7: Lots 1, 2, N½NE¼, SW¼NE¼, E½NW¼
Section 8: N½NW¼

T. 4 N., R. 62 W.
Section 1: SE¼SE¼
Section 12: NE¼NE¼, S½NE¼, S½NW¼, SW¼, N½SE¼, SW¼SE¼

NO OCCUPANCY

T. 5 N., R. 61 W.
Section 30: SE¼SW¼
Section 31: Lot 1, E½NW¼, W½SE¼

T. 4 N., R. 61 W.
Section 5: SE¼NW¼, W½SE¼
Section 6: Lot 1, SE¼NE¼
Section 7: Lot 3, NE¼SW¼, NW¼SE¼
Section 8: NW¼NE¼

T. 4 N., R. 62 W.
Section 1: E½NE¼, NE¼SE¼, SW¼SE¼
Section 2: SE¼SE¼
Section 11: E½E½, NW¼NE¼
Section 12: NW¼NE¼, N½NW¼, SE¼SE¼
Section 13: NW¼NE¼, N½NW¼

7. Fire Management

Lands at Riverside are currently not included in any fire protection plan. Fire occurrence has been extremely rare since Public Lands on the Eastern Plains comprise such a small percentage of the total acreage. The critical nature of the habitat and the possibility of visitors inadvertently starting fires on Public Land combine to make some type of protection mandatory. As a result, a cooperative fire control agreement with Weld County will be pursued. The agreement will be on a cost-reimbursable basis to the County for the suppression of wild fires on Public Lands administered by the BLM.

8. Other Support Activities

a. Access

(1) Public access across 3/8 miles of private land is necessary to accomplish the construction of a visitors interpretive center (See Figure No. 4).

(2) Approximately 7 miles of administrative access is needed to insure that access will remain available in order to accomplish the project work (See Figure No. 4).

(3) An exclusive easement for the SW¼SW¼ of Section 31, T. 5 N., R. 61 W., is needed to perform reconstruction work on original pelican nesting island located on private land (Figure No. 4).

b. Realty Actions

(1) Revocation of Public Water Reserve Withdrawal (S½NW¼ Section 5, T. 4 N., R. 61 W.,; SE¼SEP Section 12, T. 4 N., R. 62 W., 6th P.M.). These lands, withdrawn by BLM to protect natural springs, are to be totally incorporated in the management system. This classification is no longer necessary to achieve the desired protection.

Table No. 3 depicts support activities and lists manpower requirements, cost estimates, and time schedules required for the actions.

Table No. 4 illustrates other phases of needed support manpower needs and costs.

ACCESS REQUIREMENTS FOR IMPLEMENTATION OF RIVERSIDE RESERVOIR HMP

FIGURE #4

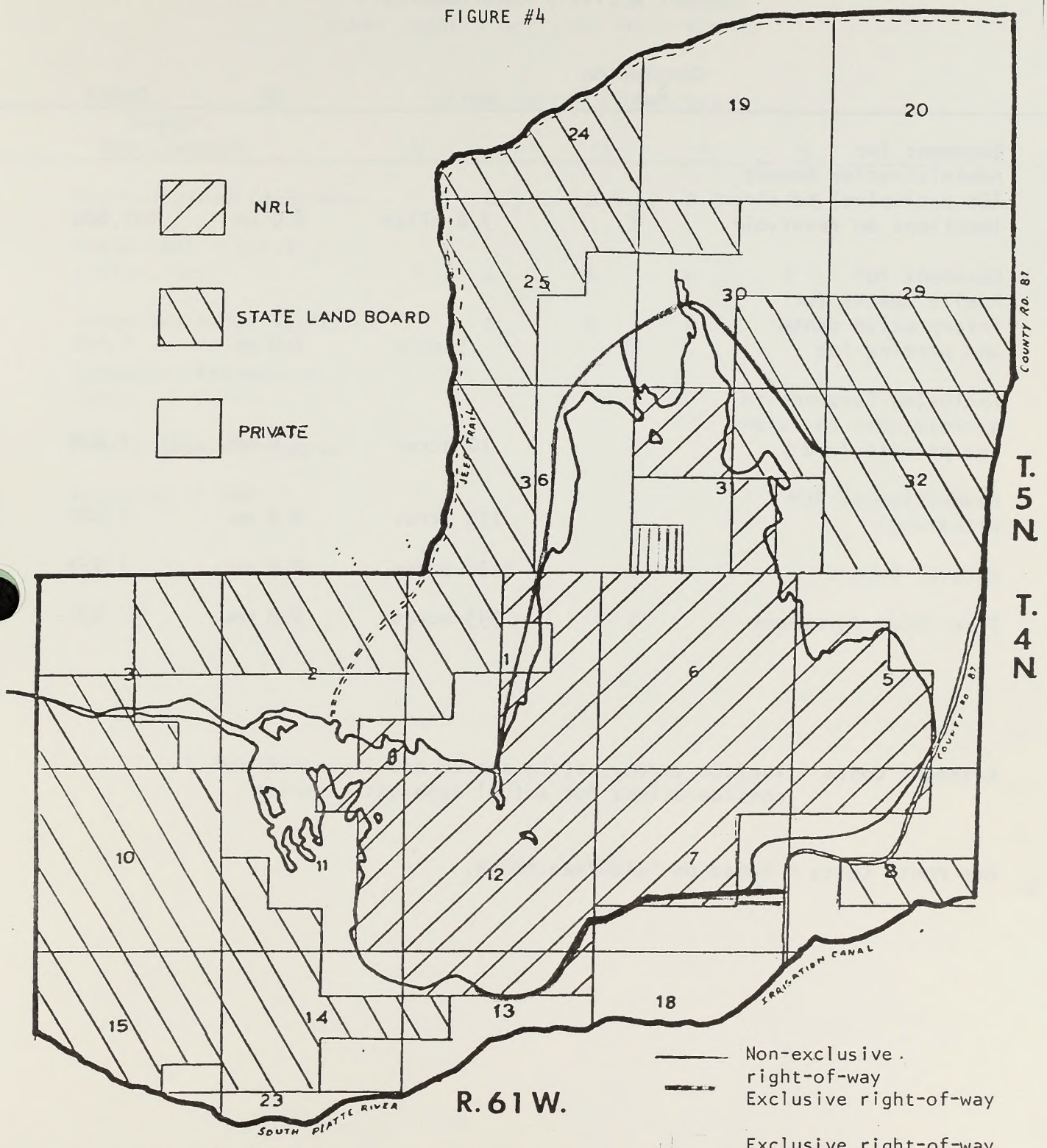


Table No. 3

Support Activity Requirements

	Completion Year	Units	MM	Costs
Easement for Administrative Access (Nonexclusive) to three locations on reservoir	2	7.0 miles	8.0 mm	$22,800
Easement for Public Access for interpretive center and parking lot	3	.5 mile	2.0 mm	4,400
Exclusive Easement to perform work on island and private land	2	20 acres	3.0 mm	7,800
Revocation of BLM Withdrawal	1	120 acres	0.8 mm	1,680
Mineral Report	1	2630 acres	0.5 mm	1,050
Fire Co-op Agreement	1	393 acres	0.3 mm	630

Easement Costs - include survey, title search and insurance and considerations for actual easement expenses.

Man Month Costs - based on $2100/man month.

Table No. 4

Other Support Activity Requirements

Support Requirements	Man Months by Out Year 1	2	3	4	5	Costs
Archeological Clearance	1	0.5	0.5	0.5	0.5	
Operations - Survey, Design, etc.	8	6	6	6	6	
Temporary Wildlife Tech.		6	6	6	6	
Temporary Recreation Tech.					6	
Public Affairs Program					6	
Printing of HMP						

Coordination with Other Agencies

This Habitat Management Plan has been prepared in cooperation with the Colorado Division of Wildlife. At the 1977 Bureau of Land Management - Division of Wildlife coordination meeting, it was agreed that the white pelican would be considered the priority species and that no activities or projects having possible detrimental effects upon the white pelican colony at Riverside reservoir would be pursued. It was further agreed that the plan would be developed and implemented under the authority of the Sikes Act Amendment (P.L. 93-452). This Act provides the broad authority to

"(1) Plan and carry out wildlife conservation and habitat rehabilitation programs on Public Lands consistent with overall land use plans;

(2) Protect significant habitat for threatened or endangered species;

(3) Enforce regulations to control off-road vehicle use (ORV) or other public use of lands subject to conservation or rehabilitation programs conducted under the Act."

(Supplement to Master Memorandum of Understanding between the Colorado Division of Wildlife and the Bureau of Land Management, Appendix 3)

The Act also provides methods to obtain supplemental funding for Federal land management agencies involved in these programs. These funds may be allocated through the BLM State Director of Colorado after consultation with the Director, Division of Wildlife, for the hiring of personnel, grants to colleges, contractual services, physical habitat improvement projects, and all activities associated with scientific resource management. These may include protection, research, census, law enforcement, habitat management propagation, live-trapping, transplantation, and regulated taking.

ENVIRONMENTAL ANALYSIS
RECORD

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

EAR FACE SHEET

OFFICE: Canon City District/NERA FY & REPORT #

ACTION: Riverside Reservoir HMP NO. OF PAGES
(Project Name, Case Type, etc.)

LOCATION: Weld County, Colorado SERIAL NO. C.-

REQUIRED BY 43 CFR 23: YES [X] NO [ ]

TEAM SIGNATURES:	TITLE	RESOURCE VALUES ASSIGNED	HOURS
	Wildlife Biologist	All	24
	Area Manager	All	
	Geologist	Minerals	0.5

ENVIRONMENTAL COORDINATOR: _____ _____
(Signature) (Date)

COMPLIANCE OFFICER: _____
(Title or Name)

DISTRICT MANAGER: _____
(Signature)

_____
(Date)

F. Environmental Assessment Record

1. Description of the Proposed Action

The proposed action is to implement the Riverside Reservoir Habitat Management Plan and to carry out all the habitat management projects and support actions described in that document. A complete listing of projects and descriptions along with aerial photographs showing locations is contained in Section D. (Planned Actions) of this plan. Other actions including support activities are contained in Section E. (Coordination with Other Activities). These projects can be categorized by types of work to be accomplished and area of work. Environmental impacts associated with projects within each group are closely related and can be analyzed as a group. The projects and actions are categorized as follows:

a. Excavation projects through regularly inundated areas

   1. Pelican Island Isolation Project

   2. Heron Peninsula Isolation Project

   3. North Island Isolation Project

b. Island reconstruction and erosion protection of islands

   1. Gabion placement and jetty construction - Pelican Island

   2. Original nesting island reconstruction and erosion control

c. Vegetation manipulation projects

   1. Cottonwood plantings - Pelican Island

   2. Cottonwood and Willow plantings - perimeter of reservoir

   3. Vegetation clearing to maintain open areas - Pelican Island

d. Livestock control

   1. Fencing

   2. Cancellation of grazing permit

e. Public use

   1. Public Access

   2. Visitors interpretive center

   3. Closure of the majority of Public Lands at Riverside to general public

f. Studies

1. Resource partitioning

2. Adjacent reservoir inventory

3. General nongame inventory

g. Other actions requiring separate consideration

1. Nest Box placement

Alternatives to the proposed action of implementing an HMP were presented and analyzed in the URA and MFP processes. It was determined as a result of these documents that the alternatives were not feasible and that an HMP would be developed and initiated.

Alternatives to the specific projects and actions exist and include the following for each category:

Excavation projects

1. No action

2. Construction of new islands within the reservoir

Island reconstruction and erosion protection of islands

1. No action

2. Construction of cement breakwater

3. Installation of gabions other than the mattress type

4. Construction of new island other than original island

5. Rebuild islands without erosion protection structures

Vegetation manipulation projects

1. No action

2. Installation of man-made nesting structures for waterbirds

Livestock control

1. No action

2. Use of present leases as individual allotments and control period and season of use

Public Use

1. No action

2. Secure public access at other locations on Riverside

3. Obtain public access for use of the entire reservoir

4. Secure public access but provide no interpretive center

Studies

1. No action

Nesting Box placement

1. No action

II. Description of the Environment

A description of the areas impacted by the proposed actions is contained in the Introductory Section of the HMP (Section A). Additional descriptions can be found in the narratives explaining each proposed action in Section D (Planned Actions).

III. Unmitigated Impacts

Implementation of the HMP could have the following impacts upon the environment:

Associated with Project Work

Many of the proposed projects require the use of heavy equipment and substantial manpower. In order to get the equipment to the project site, it will be necessary to travel some distance around the reservoir. Some vegetation loss on the upland areas will occur. Restoration of these areas could take 5 to 10 years through natural recovery, and blowouts could result from this disturbance.

Heavy equipment operation with associated noise generation and human disturbance may disturb wildlife in the area. Additionally, some wildlife may be directly killed during the construction projects.

The operation of heavy equipment could adversely affect air quality by adding dust and hydrocarbons to the atmosphere.

Operations could result in spillage of polluting liquids including oil and/or gasoline. These could adversely affect the water quality of Riverside reservoir.

Archeological sites could be damaged or destroyed during construction.

Fence construction could impede or restrict movement of wildlife such as antelope.

Vegetation manipulation projects may directly kill small animals and destroy the habitat of some of the lesser known species.

Construction of a visitors center with parking lot and sanitary facilities will permanently remove vegetation and alter habitat on approximately 3 acres. Presence of the elevated observation deck will impact the visual character of the area. Additionally, fences, signs, restrooms, and parking lot will detract from the aesthetic values. These impacts are lessened to some degree since the proposed location is not in a natural area: the dike, a man-made structure partially of concrete, adjacent farm properties, powerlines, etc., are already present.

Influx of people to the interpretive center could cause disturbance of the white pelican and other waterbirds as well as waterfowl, raptors, and other species of wildlife.

Litter and refuse left from visitors could affect the aesthetic values.

Nest box placement in the cottonwood groves and on fence posts could further detract from aesthetics since they are artificial, man-made structures. Undesirable species such as starlings and house sparrows could utilize these boxes and increase in numbers thus increasing competition with native species of birds.

Associated with Support Actions

Seasonal closure of Public Lands other than the visitors center will have only minor impacts on recreational opportunities. Existing land patterns have already virtually barred use of Public Lands at Riverside reservoir. Only occasional use by people, usually trespassing on private lands to gain access to the reservoir, occurs. Activities include dune buggying, fishing, rabbit hunting, waterfowl hunting, etc. Closure would eliminate these uses on Public Lands. Closure will allow for oil and gas exploration only during the open season. This, however, follows special recommendations of the Umbrella EAR for Oil and Gas leasing for Riverside reservoir.

Biological studies of the white pelican could cause disturbance of the nesting colony. Human presence on the island could cause abandonment of nests of both white pelicans and other waterbirds. Lowered nesting success and lower productivity per nest could result from this disturbance.

Cancellation of grazing permits will alter vegetation in the areas affected. Vegetative structure will probably be altered with the taller, more dense growth becoming evident. Wildlife species adapted to shorter vegetative situations will be displaced.

Lessees will lose a total of 20 animal unit months which, when compared with their overall operations, is insignificant.

The planned reptile, amphibian, and general nongame inventory will require collection of some of these animals. Live traps, snap traps, mist nets, etc., may be used to capture the animals. Some loss of individuals can be expected even in the live-capture methods. Mortality associated with marking, tagging, etc., can also be anticipated.

Disturbance of other species of wildlife including nesting birds could occur while personnel conduct the inventory.

Associated with Alternatives

The no action alternative for each of the proposals would generally result in more severe impacts than the proposed actions. Acceptance of the no action alternative for the habitat management projects designed to protect or increase habitat components would eventually result in the loss of some of the breeding populations of these birds at Riverside. In the case of the white pelican, the loss of the breeding population for the entire state of Colorado would occur.

No action alternatives for the support actions would result in failure to fully achieve the objectives of the habitat management plan.

Impacts of each of the other alternatives listed are analyzed below:

Excavation projects

Construction of new islands - This alternative would require substantially more work than proposed action. Men and equipment would be in the area for longer periods of time. In general, the same impacts as excavation will occur but for longer times.

Island reconstruction and erosion protection of islands

Construction of other types of breakwaters, gabions, and the like will require virtually the same manpower, equipment, and materials as the proposed action. Impacts would probably have no significant differences. Construction of cement type breakwaters would be more visible than the gabions.

Construction of a new island instead of rebuilding the original nesting island again requires far more work with greater impacts than the proposed action.

Islands built without adequate erosion protection structures would require constant maintenance or be inundated within a few years. Reconstruction would then be necessary creating the same impacts over longer periods of time. The aesthetic values of islands constructed without the gabions would probably be higher.

Vegetation manipulation projects

The only alternative to planting trees to support nesting waterbird rookeries is to construct artificial nesting structures. Visual impacts would be significantly greater than with tree plantings, and maintenance of the structures with associated human disturbance would impact the areas over a greater period of time.

Livestock control

Use of the present lease areas as discrete allotments on which season and periods of use were controlled would have the same basic effects as cancellation with the exception of any loss of AUM's to the lessees. Vegetation would increase but at a slower rate and perhaps not to the extent that it would under complete cancellation.

Public use

Public access at other locations on Riverside reservoir would require much longer rights-of-way and access roads. More vegetation would be destroyed by road construction, and wildlife disturbance would be greater.

Access to the entire reservoir with no restrictions as to use would eliminate the white pelican as a breeding population. This impact alone would negate the purpose and objectives of the HMP.

Acquisition of public access alone with no provisions for an interpretive center or other improvements would have greater impacts than the proposed action. The lack of guidance and adequate opportunities to easily observe the wildlife of the area encourages visitors to try to get closer or move to better vantage points. A clearly designated area where public use is allowed with facilities to aid the visitors gives greater control over those visitors; hence, lesser impacts.

The above alternatives, for the reasons discussed, will not be implemented.

IV. Mitigating Measures

Mitigation of the adverse impacts is possible to some extent on nearly all proposed actions. A discussion of these measures follows:

Project Work

Upland areas disturbed by heavy equipment will be reseeded with native vegetation as soon as activities cease. Other precautions to prevent erosion such as mulching with straw will be taken where individual conditions warrant.

Project work will be scheduled only during the late summer or fall when nesting activities are completed and many of the birds have left the area. Disturbance by noise and humans should be minimal at these times.

The level of work ongoing at any one time will not be such that significant air quality or water quality degradation will occur.

Archeological inventories will be conducted and clearance obtained on each specific project site before work is accomplished.

Fence construction will meet specifications as contained in BLM Manual 1737, which requires wire spacing that will allow passage of antelope and other big game animals.

Vegetation manipulation projects will be carried out only after an inventory of the specific site is conducted and determination that the site is not essential or crucial habitat for any species is made.

Excavation projects are to be located in areas regularly inundated and generally devoid of vegetation. The only exception is a strip of land approximately 30 yards in width on Heron Peninsula. Some destruction of willows will occur in this area. Since the areas are regularly exposed and will be exposed during construction, no disturbance of the aquatic environment is anticipated. Material taken from the excavations will be placed around the islands in areas flooded at high water. No disposal on upland areas is planned.

Mitigation measures for construction of the visitors center include planting native cottonwoods around the observation deck to disrupt the visual pattern of the tower and painting to blend in with the background colors. Designs that are aesthetically pleasing will be sought for the buildings at the center. Litter and trash receptacles and vault type toilets will be installed and policed on a regular basis to prevent litter and refuse problems. The center will be designed so that closure is possible.

Regulations pertaining to closed areas on the reservoir will be posted to prevent use of other areas. Location of the center will be approximately 1 mile from the nesting island. This location will maintain the low level of disturbance to which the pelicans are accustomed.

Nest boxes will be built to specifications that provide for use of natural materials and painted earth colors. Entrance hole diameters will be such that a variety of species will be benefited. Use of varied sized boxes and entrances should exclude nondesirable species in many cases.

Support Actions

Closure of Public Lands at Riverside other than the visitors center is mitigated to some degree by the establishment of the center. Conditions are now such that the general public cannot identify or use any of the Public Land on the reservoir. Establishment of this public use area will provide better recreational opportunities for more persons than previously existed.

Biological studies of the white pelican will be conducted by only trained personnel and only upon approval of the Bureau of Land Management and the Division of Wildlife. Proposals will clearly state objectives and procedures including time frames for work to be accomplished. All precautions to avoid disturbance of breeding birds will be taken. These include, but are not limited to, no access upon the nesting island(s) until after incubation is complete and restriction of low level flights (below 500 feet) over the island(s) to periods when pelicans or other nesters are not present (October 1 to March 15).

Cancellation of grazing permits and resultant impacts are of only minor significance. Nearly all impacts are beneficial in that water quality in the small ponds will improve, and cover for many species will increase.

Impacts associated with the general nongame inventory and habitat study can be lessened by the use of live traps for collection purposes; by restricting areas of special biological significance until the activities cease, i.e., area around raptor nest or Pelican island until after nesting season; and by limiting the capture or taking of those species that are not abundant.

V. Unavoidable Impacts

Regardless of the precautions, construction work will cause some disturbance of some wildlife, and some direct loss of individuals will occur.

Even though inventories are completed and archeological clearance is obtained, damage to unknown sites could still occur.

Soil and vegetative disturbance from heavy equipment will still occur, though for only short times.

Loss of habitat will occur for some species as a result of vegetation manipulation, but only a small percentage of total habitat type will be affected.

Influx of people into the visitors center will cause some minor disturbance of wildlife in the immediate area. Some litter and refuse will be generated regardless of efforts to control it.

Construction of the interpretive center will result in loss of vegetation and will impact the visual resources to a minor degree.

Some mortality of small mammals and other nongame can be expected as a result of the nongame study. The overall loss will be more than compensated for by the information gathered which will be used in future considerations for these species.

Minor mortality of wildlife associated with fencing can be expected even if Manual requirements are followed.

VI. Relationship Between Short-Term Use and Long-Term Productivity

Adverse impacts are generally short-term in duration. Site disturbance will in most cases be in unvegetated areas under water at some time of each year.

Vegetation losses in most projects will be short-term with vegetation restoration taking approximately one year. In those projects where actual vegetation manipulation is scheduled such as cottonwood planting, the impacts will be long-term, but benefits are expected to outweigh the minor impacts.

Long-term loss of vegetation will occur where permanent roads are constructed and at the visitors interpretive center.

Wildlife disturbance and losses will be for only the periods of construction, usually less than one month for each project.

The short and long-term losses of natural production and wildlife will be offset by the increased long-term productivity of the area. Implementation of the HMP with scheduled project work will increase overall wildlife productivity at Riverside as well as add aesthetically to many other reservoirs in the area.

Failure to implement the program would have greater adverse long-term impacts on the area. Loss of the nesting island would occur, and the breeding population of the white pelican in Colorado would be eliminated. Additionally, loss in production of other waterbird species would be experienced.

VII. Irreversible and Irretrievable Commitment of Resources

The major commitment of resources is the expenditure of funds required to accomplish the proposed projects.

It is conceivable that some archeological sites may be accidentally damaged or destroyed in spite of surveys conducted prior to project work.

VIII. Public Interest and/or Controversy

Appendix No. 2 of the HMP contains publications illustrating public interest in Riverside reservoir. Opinions and suggestions have been solicited from the Colorado Division of Wildlife and Colorado State University, Riverside Irrigation District, and Riverside Gun Club.

The Denver Basin MFP involved public participation in development of recommendations to initiate a Habitat Management Plan. During that process comments from numerous organizations, agencies, and individuals were incorporated into the final decision.

Copies of the HMP have been sent to the Colorado Division of Wildlife, the Audubon Society, The Wildlife Society, Colorado Wildlife Federation, and Colorado State University, Riverside Irrigation District, and Riverside Gun Club.

The Riverside Irrigation District and Riverside Gun Club have expressed concerns that opening the Public Lands at Riverside to use by the general public would create a trespass problem onto their adjacent private lands. These concerns were also considered in the final plan.

IX. Recommendations:

It is recommended that the implementation of the HMP be allowed as proposed provided that the mitigating measures described in Section IV. of this EAR be incorporated into the Job Documentation Reports and project designs.

It is further recommended that if project designs are altered or additional projects are required as a result of new information, that supplemental environmental records be prepared on a case-by-case basis.

IMPLEMENTATION SCHEDULE AND COST ESTIMATE

G. Implementation Schedule of Cost Estimate

Cost estimates are based on the following:

Earth Work - Excavation	$ 1.50/yd^3
Fence Construction - Materials and Labor	$2,200/mi
Gabion and Jetty Costs	Engineering Estimates
Signs/Closure and Installation	$ 100/sign
Cattleguard - County Installed	$2,000 each
Man/months	$2,400

Projects are included in program packages by priority. If funding should become available before the programmed dates, priorities outlined will be followed.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE COVER SCHEDULE

PACKAGE IDENTIFICATION: C 0 7 9 (STATE | FY) | Priority: | Package Life: Six years

Package Name: Riverside Reservoir HMP

Package Purpose: Protection and enhancement of Colorado threatened species & other combined species of wildlife.

Program Area:

(1)		CURRENT YEAR FY 19 (2)	BUDGET YEAR FY 19 (3)	PROGRAM YEAR FY 19 (4)	PROGRAM YEAR + 1 FY 19 (5)	PROGRAM YEAR + 2 FY 19 (6)	PROGRAM YEAR + 3 FY 19 (7)	PROGRAM YEAR + 4 FY 19 (8)	TOTAL (9)	AVG. ANNUAL PROGRAM OPERATIONS FY 19 (10)
A. COST DATA		$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S
Total Costs (Form 1610–28)		5	43	264	58	404	213	19	1006	20
Construction (Form 1610–28)		-	-	-	-	-	150	-	150	-
Construction Maintenance (Form 1610–28)		-	-	-	-	-	-	2	2	5
Total Costs Less Construction and Maintenance		5	43	264	58	404	63	17	854	15
WASHINGTON OFFICE USE ONLY										
B. MANPOWER DATA		MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS
Permanent		2.5	13	9	7	10	2	1		
Temporary			3	11	9	10	13	6		
C. OUTPUT AND WORKLOAD MEASURE DATA		QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Habitat Management Plan Developed	a	1								
	b									
	c									
Acres Critical Habitat Protected - Threatened Species	a			5						
	b			0						
	c			5						
Acres Critical Habitat Improved - Threatened Species	a				10					
	b				0					
	c				10					
Acres Critical Habitat Rehabitated - Threatened Species	a					3	3			
	b					0	0			
	c					3	3			
Miles of Protection Fence Constructed	a				1	3	5			
	b				0	0	0			
	c				1	3	5			
Acres of Habitat Expanded for Raptors and Passerines	a						20			
	b						0			
	c						20			

(Instructions on reverse)

Form 1610–27 (October 1974)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE COVER SCHEDULE

PACKAGE IDENTIFICATION: C 0 7 9 (STATE / PY) | Priority | Package Life: Six years

Package Name: Riverside Reservoir HMP

Package Purpose:

Program Area: Northeast Resource Area

(1)		CURRENT YEAR FY 19 (2)	BUDGET YEAR FY 19 (3)	PROGRAM YEAR FY 19 (4)	PROGRAM YEAR + 1 FY 19 (5)	PROGRAM YEAR + 2 FY 19 (6)	PROGRAM YEAR + 3 FY 19 (7)	PROGRAM YEAR + 4 FY 19 (8)	TOTAL (9)	AVG. ANNUAL PROGRAM OPERATIONS FY 19 (10)
A. COST DATA		$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S
Total Costs (Form 1610–28)										
Construction (Form 1610–28)										
Construction Maintenance (Form 1610–28)										
Total Costs Less Construction and Maintenance										
WASHINGTON OFFICE USE ONLY										
B. MANPOWER DATA		MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS
Permanent										
Temporary										
C. OUTPUT AND WORKLOAD MEASURE DATA		QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Artificial nesting structures for nongame birds	a				10	10	10	10		
	b									
	c									
Acres Withdrawn for Wildlife Protection	a		2,629							
	b		0							
	c		2,629							
Nonconsumption Visitor Days Added	a						1,000	2,000		
	b						0	0		
	c						1,000	2,000		
Threatened Species Habitat Inventoried (Acres)	a			8,500						
	b			0						
	c			8,500						
Nongame Habitat Inventoried (Acres)	a				4,000	4,500				
	b				0	0				
	c				4,000	4,500				
	a									
	b									
	c									

(Instructions on reverse)

Form 1610–27 (October 1974)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PACKAGE IDENTIFICATION

C	0	7	9
STATE		PY	

Package Name
Riverside Reservoir HMP

PROGRAM PACKAGE INPUTS SCHEDULE

SUBACTIVITY AND POSITION IDENTIFICATION	CURRENT YEAR FY 19			BUDGET YEAR FY 19			PROGRAM YEAR FY 19			PROGRAM YEAR + 1 FY 19			PROGRAM YEAR + 2 FY 19			PROGRAM YEAR + 3 FY 19			PROGRAM YEAR + 4 FY 19		
	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
2140 Easement Acqulsition				12.0	-	5	14.4	-	6	4.8	-	2									
Permanent Personnel					-	4		-	4		-	2									
Temporary Personnel					-	1		-	2		-	-									
4210 Lands and Realty																					
3237 Withdrawal Review				2.4	-	1															
Permanent Personnel					-	1															
Temporary Personnel					-	-															
4130 Minerals																					
2033 Field Exam				2.4	-	1															
Permanent Personnel					-	1															
Temporary Personnel					-	-															
4330 Recreation Management																					
4333 Field Exam				2.4	-	1	2.4	-	1	2.4	-	1	2.4	-	1	2.4	-	1			
Permanent Personnel					-	1		-	-		-	-		-	-		-	-			
Temporary Personnel					-	-		-	1		-	1		-	1		-	1			
													14.4	-	6						
Permanent Personnel															5						
Temporary Personnel														-	1						
0118 Public Information																4.8	-	2	4.8	-	2
Permanent Personnel																	-	-		-	-
Temporary Personnel																	-	2		-	2

(Instructions on reverse)

Form 1610-28 (October 1974)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE INPUTS SCHEDULE

PACKAGE IDENTIFICATION			
C	0	7	9
STATE		PY	

Package Name: Riverside Reservoir HMP

SUBACTIVITY AND POSITION IDENTIFICATION	CURRENT YEAR FY 19			BUDGET YEAR FY 19			PROGRAM YEAR FY 19			PROGRAM YEAR + 1 FY 19			PROGRAM YEAR + 2 FY 19			PROGRAM YEAR + 3 FY 19			PROGRAM YEAR + 4 FY 19		
	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M	TOTAL COST (000's)	POSITIONS	M/M
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
-4330 Recreation (cont.)																					
5171 Facility Maintenance																12.0	1 (T)	5	12.0	1(T)	5
Permanent Personnel																	-	1		-	1
Temporary Personnel																	-	4		-	4
-4350 Wildlife Management																					
5725 Wetland Studies										12.0	-	5	12.0	-	5	12.0	-	5			
Permanent Personnel											-	1		-	1		-	1			
Temporary Personnel											-	4		-	4		-	4			
5825 Endangered Res.Studies							16.8	-	7	4.8	-	2	4.8	-	2	4.8	-	2			
Permanent Personnel								-	1		-	-		-	-		-	-			
Temporary Personnel								1(T)	6		1(T)	2		1(T)	2		1(T)	2			
5754 Wetland S & D										4.8	-	2	4.8		2						
Permanent Personnel											-	1		-	1						
Temporary Personnel											-	1		-	1						
5854 Endangered Res. S & D				19.2	-	8	14.4		6	9.6	-	4	9.6	-	4						
Permanent Personnel					-	6		-	4		-	3		-	3						
Temporary Personnel					-	2		-	2		-	1		-	1						

(Instructions on reverse)

Form 1610-28 (October 1974)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date 6-9-77
State Colorado
Subactivity 4350
Priority 1

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name: Boundary Signing
b. Road System Name *(if applicable)*:
2. Project *(no.)*:
3. County *(name)*: Weld
4. Congressional District:
5. Geographic Location *(distance and direction from nearest town)*: Riverside Reservoir 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Sign procurement and placement				4						4
4. Subtotal				4						4
5. Service Center S&D										
6. Total Construction Cost *				4						4
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Public lands at Riverside will be closed to public use and entry from March 15 to October 1 each year. Regulatory signs marking boundary and notifying of closure are required.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

N/A

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

N/A

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 836-152

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6-9-77
State	Colorado
Subactivity	4350
Priority	1

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name		b. Road System Name *(if applicable)*
Pelican Island Gabions and Jetty		
2. Project *(no.)*	3. County *(name)* Weld	4. Congressional District

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	1978 BY (d)	1979 PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Gabion Mattresses - rock filled		1 unit			190					190
Concrete Jetty		1			20					20
4. Subtotal					210					210
5. Service Center S&D										
6. Total Construction Cost *					210					210
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Project is to halt erosion of and thereby stabilizing a 5 acre nesting island for the white pelican, a Colorado State Threatened Species. Project work to be contracted.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

Pelican Island Isolation Project

3. Status of survey and design

Survey and design to be accomplished in BY by District and Colorado State Office personnel

4. Status of land or easement acquisition

None needed

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [X] State Office d. [ ] Combination of b and c

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 836-152

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	2

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name		b. Road System Name *(if applicable)*
Pelican Island Isolation Project		
2. Project *(no.)*	3. County *(name)* Weld	4. Congressional District

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Channel excavation		1								
and removal of 4000 yds										
of material					6					6
4. Subtotal					6					6
5. Service Center S&D										
6. Total Construction Cost *					6					
7. Maintenance Cost							2		2	4
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Isolation project is designed to provide additional security to resting white pelicans, a Colorado State Threatened Species, by eliminating a sandbar which could allow mammalian predators access to the nesting island during a critical period.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

Pelican Island Gabion and Jetty Project

3. Status of survey and design

Survey and design to be accomplished in BY by District Personnel

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 838-152

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	3

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name	b. Road System Name *(if applicable)*
Heron Peninsula Isolation Project	

2. Project *(no.)*	3. County *(name)*	4. Congressional District
	Weld	

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	COST ($1,000's) PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Channel excavation of		1								
10,000 yds material						15				15
4. Subtotal						15				15
5. Service Center S&D										
6. Total Construction Cost *						15				
7. Maintenance Cost									2	2
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Excavation through narrow peninsula to create 5 acre nesting site for white pelicans, a Colorado State Threatened Species.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

To be accomplished in PY by District Personnel

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

N/A

8. Describe flood hazard and mitigating features planned

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 836-152

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	4

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name	b. Road System Name *(if applicable)*
Cottonwood Planting Pelican Island	

2. Project *(no.)*	3. County *(name)*	4. Congressional District
	Weld	

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	COST ($1,000's) PY (e)	PROGRAM YEAR +1 (f)	PROGRAM YEAR +2 (g)	PROGRAM YEAR +3 (h)	PROGRAM YEAR +4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Cottonwood planting		50				2				2
Protective fencing		1 mile				2				2
4. Subtotal						4				4
5. Service Center S&D										
6. Total Construction Cost *						4				4
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Cottonwood trees lost to erosion on nesting island will be replaced to provide shade for white pelicans and nesting habitat for other waterbirds.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

N/A

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

N/A

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 838-152

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	5

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name: Original Nesting Island Restoration Project

b. Road System Name *(if applicable)*:

2. Project *(no.)*:

3. County *(name)*: Weld

4. Congressional District:

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition		20 acres	Excl.			1				1
2. Survey and Design										
3. Construction Project Features										
Rebuild nesting island										
lost to erosion										
3,000 yds							45			45
Gabions to protect rebuilt Island							300			300
4. Subtotal						1	345			346
5. Service Center S&D										
6. Total Construction Cost *						1	345			346
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Project will rehabilitate former nesting site for the white pelican, a threatened species in Colorado.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

Survey and design to be accomplished in PY+1 by Colorado State Office and District personnel.

4. Status of land or easement acquisition

Exclusive easement for 20 acres needed to perform reconstruction to be accomplished in PY+1

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [XX] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	6

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name	b. Road System Name *(if applicable)*
Wetland Fencing	

2. Project *(no.)*	3. County *(name)*	4. Congressional District
	Weld	

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Fence Construction		3 miles					8			8
Cattleguard		1					2			2
4. Subtotal							10			10
5. Service Center S&D										
6. Total Construction Cost*							10			10
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Fencing will restrict cattle grazing from wetland areas which provide important habitat to waterfowl, shorebirds, and wading birds.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

None

3. Status of survey and design

Survey completed - Contract and design by District Personnel

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	7

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name: North Island Isolation Project		b. Road System Name *(if applicable)*
2. Project *(no.)*	3. County *(name)*: Weld	4. Congressional District

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	PY (e)	PROGRAM YEAR +1 (f)	+2 (g)	+3 (h)	+4 (i)	TOTAL (j)
1. Land or Easement Acquisition		7 mi.	Non-Ex		6					6
2. Survey and Design										
3. Construction Project Features										
Excavation of 4000 yds channel		1						6		6
4. Subtotal					6			6		12
5. Service Center S&D										
6. Total Construction Cost *					6			6		12
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Project will isolate an island at the northern end of Riverside Reservoir possibly enabling further expansion of nesting habitat for white pelican and other species.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

Survey and design to be accomplished in PY + 2 by District personnel

4. Status of land or easement acquisition

Non Exclusive easement for administrative purposes to be obtained by PY.

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

District Office

8. Describe flood hazard and mitigating features planned

Continuation of Narrative *(attach additional sheet, if necessary)*

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date 6/9/77
State Colorado
Subactivity 4350
Priority 8

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name Cottonwood and Willow Planting - Reservoir

b. Road System Name *(if applicable)*

2. Project *(no.)*

3. County *(name)* Weld

4. Congressional District

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	COST ($1,000's) PY (e)	PROGRAM YEAR +1 (f)	PROGRAM YEAR +2 (g)	PROGRAM YEAR +3 (h)	PROGRAM YEAR +4 (i)	TOTAL (j)
1. Land or Easement Acquisition										
2. Survey and Design										
3. Construction Project Features										
Cottonwood and Willows		500						2		2
Protective fencing		5 miles						13		13
4. Subtotal								15		15
5. Service Center S&D										
6. Total Construction Cost *								15		15
7. Maintenance Cost										
8. Total State Man-Months.										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Plantings around shoreline designed to provide additional habitat to raptors and other nongame birds. Temporary fencing of plantings needed for protection from livestock grazing.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

N/A

4. Status of land or easement acquisition

N/A

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [ ] Service Center c. [ ] State Office d. [ ] Combination of b and c

N/A

8. Describe flood hazard and mitigating features planned

N/A

Continuation of Narrative *(attach additional sheet, if necessary)*

GPO 836-162

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONSTRUCTION PROJECT ANALYSIS

Date	6/9/77
State	Colorado
Subactivity	4350
Priority	9

Instructions: Submit four (4) copies to Director (510) and one (1) copy to DSC (400).

A. PROJECT IDENTIFICATION

1a. Project Name: Riverside Reservoir Visitors Interpretive Center

b. Road System Name *(if applicable)*:

2. Project *(no.)*:

3. County *(name)*: Weld

4. Congressional District:

5. Geographic Location *(distance and direction from nearest town)*

Riverside Reservoir - 2 3/4 miles north of Masters, Colorado

B. INPUT BY FISCAL YEAR

DESCRIPTION (a)		UNITS NO. (b)	UNITS TYPE (c)	COST ($1,000's) BY (d)	COST ($1,000's) PY (e)	PROGRAM YEAR +1 (f)	PROGRAM YEAR +2 (g)	PROGRAM YEAR +3 (h)	PROGRAM YEAR +4 (i)	TOTAL (j)
1. Land or Easement Acquisition		½ mi	Excl.			1				1
2. Survey and Design										
3. Construction Project Features										
Visitors Center-observatory										
parking lot, toilets								150		150
4. Subtotal								150		151
5. Service Center S&D										
6. Total Construction Cost*								150		151
7. Maintenance Cost										
8. Total State Man-Months										
a. Construction	P									
	T									
b. Maintenance	P									
	T									

C. PROJECT DESCRIPTION

1. Narrative

Project will include visitors observation deck with interpretive displays. Vault type toilets and refuse receptacles. One half mile access across private lands is needed for 30 ft right-of-way to construct 16' gravel road. Parking lot will be of sufficient size to accommodate 10 vehicles. Regulatory and informative signs will be required.

* *Except for BY, include 5% administrative charge, and 15% per year for inflation.*

(Continued on reverse)

C. PROJECT DESCRIPTION (CON.)

2. List other program year proposals related to this project

3. Status of survey and design

To be completed in PY + 3

4. Status of land or easement acquisition

Exclusive easement to be secured by PY + 1

5. Is there a completed MFP for this area? [X] yes [ ] no
Has an activity plan or special area plan been completed? [X] yes [ ] no *(If "yes," give name)*

Riverside Reservoir HMP

6. Has an environmental analysis been made for this project? [X] yes [ ] no *(If "yes," was it* [X] *prior to* [ ] *during* [ ] *after S&D? If "no," explain how and when the environmental impacts were considered)*

7. How do you propose to accomplish the design of this project?
a. [ ] A&E Contract b. [X] Service Center c. [ ] State Office d. [ ] Combination of b and c

8. Describe flood hazard and mitigating features planned

Unknown

Continuation of Narrative *(attach additional sheet, if necessary)*

MANAGEMENT EVALUATIONS
AND REVISION

H. Management Evaluations and Revision

The majority of the objectives and planned actions are of such a nature that simple visual observations will provide adequate evaluation. Habitat treatment projects will be inspected on an annual basis to determine maintenance needs or possible modifications. Evaluations for each action are listed on Form 6620-3 following Section D.

Breeding bird surveys will be made yearly to determine status for each of the key species. This will include approximately 10 hours of fixed-wing aircraft observation time for each nesting season. During the 1978 nesting season, the survey will be conducted as part of the continuing CSU study. Surveys for the following years will be accomplished by either permanent or temporary wildlife personnel of the Northeast Resource Area Office, Canon City District. Time to conduct such surveys is provided for in implementation schedules.

The Riverside Reservoir HMP will be reviewed annually to determine progress toward the goals and objectives contained herein. Additional information from research will be analyzed, and revisions or modifications of the plan will be made where applicable or necessary.

If for any reason the white pelican colony should abandon their use of Riverside reservoir, the HMP will be revised as soon as possible.

PUBLIC AFFAIRS

I. Public Affairs

Preparation of this HMP is the result of coordination with other interested groups and agencies. Goals and objectives as well as many of the specific projects were formulated only after consultation with such groups as Colorado Division of Wildlife, Riverside Irrigation District, Riverside Gun Club, and staff members of Colorado State University.

The white pelican has generated considerable interest in Riverside reservoir. In order to inform the general public of the desired objectives of this management plan, a public awareness program is necessary. The following are the objectives of such a program:

Objectives

1. To inform the public of the critical nature and unique character of the habitat at Riverside reservoir.

2. To focus attention on the threatened status of the white pelican.

3. To develop an understanding of the programs and regulations necessary to protect the wildlife populations.

4. To make the public aware that this program has been developed through the Sikes Act and through cooperative efforts of the BLM and DOW.

5. To develop a method which will allow the public to communicate and provide feedback more readily.

Several of these objectives can be fully met only after construction of the visitors interpretive center which will provide access to the public.

Methods used to accomplish these objectives include newspaper and magazine articles, TV and radio presentations, slide presentations, publication of research findings and conclusions, show-me trips to the area, and interpretive displays and brochures for distribution after completion of the visitors center.

Personnel from the Bureau of Land Management, Colorado Division of Wildlife, and Colorado State University will provide the manpower to disseminate this information.

CONCURRENCE AND
APPROVAL

J. Concurrence and Approval

This Habitat Management Plan has been prepared, reviewed, and approved by the undersigned parties. Final approval date shall be that given by the last signee:

Prepared by:

A. Grant Gunderson
BLM Wildlife Biologist

May 16, 1978
Date

Approved by:

Melvin D. Clausen
District Manager

May 17, 1978
Date

Eugene P. Cook
Regional Wildlife Manager

August 24, 1978
Date

Dale R. Andrus
State Director

11/9/78
Date

Jack R. Grieb
Director

11-22-78
Date

MAPS AND APPENDIX

Appendix No. 2

Publications

THE DENVER POST JANUARY

BLM Site Hunting Doubtful

By BOB SAILE
Denver Post Outdoor Editor

The Bureau of Land Management is developing a wildlife habitat management plan for Colorado's Riverside Reservoir—where the BLM owns 3,150 acres of public land—but the plan is unlikely to include a provision for public hunting or fishing.

Although the public is technically within its rights to set foot on the Riverside BLM land, such public access isn't encouraged by the BLM and most of the hunting at Riverside is done by a private club which has been in existence since 1913.

The club is the Riverside Duck Club, whose members include several prominent Denver professional men. The club owns about 120 acres in two separate blocks along the reservoir shoreline, and other land is leased from the Riverside Reservoir and Land Co., which operates the lake for irrigation. The club has "about 24 or 25" members, a member said.

Riverside, 3,160 surface acres when full, is just north of U.S. 34 in Weld County, east of Orchard, Colo.

IT ATTRACTS DUCKS, geese and other waterfowl, including a species classified [illegible] state as threatened—the white pel-

The presence of this relatively rare bird is one reason BLM officials are wary of public hunting and other recreation at Riverside, they said. About 200 to 250 nesting pairs of pelicans spend part of the year on an island in the reservoir.

Dale Andrus, state director for BLM, said BLM wildlife experts "are looking at all aspects of habitat management as it relates to Riverside, and one would be public access for hunting or other recreation uses."

"On the other hand," he said, "the primary purpose of the habitat plan is to protect the pelican."

When the management plan is drafted, Andrus said, the BLM will confer with the Colorado Division of Wildlife and the various private interests or landowners at Riverside to see if public access for recration is "realistic."

Pressed as to whether he thinks public hunting and other uses are realistic, Andrus answered, "I would question it."

While a good map would make it possible for a public hunter or fisherman to enter the reservoir legally, he would encounter problems from that point. One complication is that the BLM acreage zigzags in rectangular patterns along the shoreline. A good deal of the shoreline and part of the north cove of the lake aren't BLM land. Instead, the land is either privately owned or school trust land administered by the State Land Board and leased to private interests.

ANOTHER COMPLICATING circumstance is that the water level of Riverside frequently fluctuates. In extreme, low-water periods, most of the actual shoreline would be on federal land. But at high-water times, a good portion of it wouldn't.

Of the BLM acreage at Riverside, 2,780 acres is under the surface of the water during high-water periods and 370 acres would be dry land at these times.

One member of the Riverside Duck Club who declined to be quoted by name takes the position that BLM doesn't own any of the Riverside acreage—not anymore, anyway.

He said the federal government "granted" the land to the Riverside Reservoir and Land Co. in 1903 and that the reservoir company legally owns it now.

The duck club member also described the hunting at Riverside as "frankly not that good."

"We traditionally get one or two good shoots (every season), but the changing water level is a problem," the member said. "You have trouble concealing yourself out in the open when the water drops, and it freezes early in the year a lot of the time."

Andrus disagrees with the member's assessment of the land ownership.

"I have a 15-page legal brief from the regional solicitor's office which says it still is BLM land," said Andrus.

He said the Department of the Interior gave the reservoir company a "right-of-way" to use the land for irrigation purposes indefinitely, but didn't "grant" the land to the company.

A RESERVOIR COMPANY, spokesman, Cecil Osborne, said he isn't challenging BLM ownership of acreage at Riverside. Osborne is the superintendent of the company.

Osborne said the reservoir company was in effect granted the right to "occupy and use the land for reservoirs and canals, and that right was earned by construction and use of these facilities as time went on."

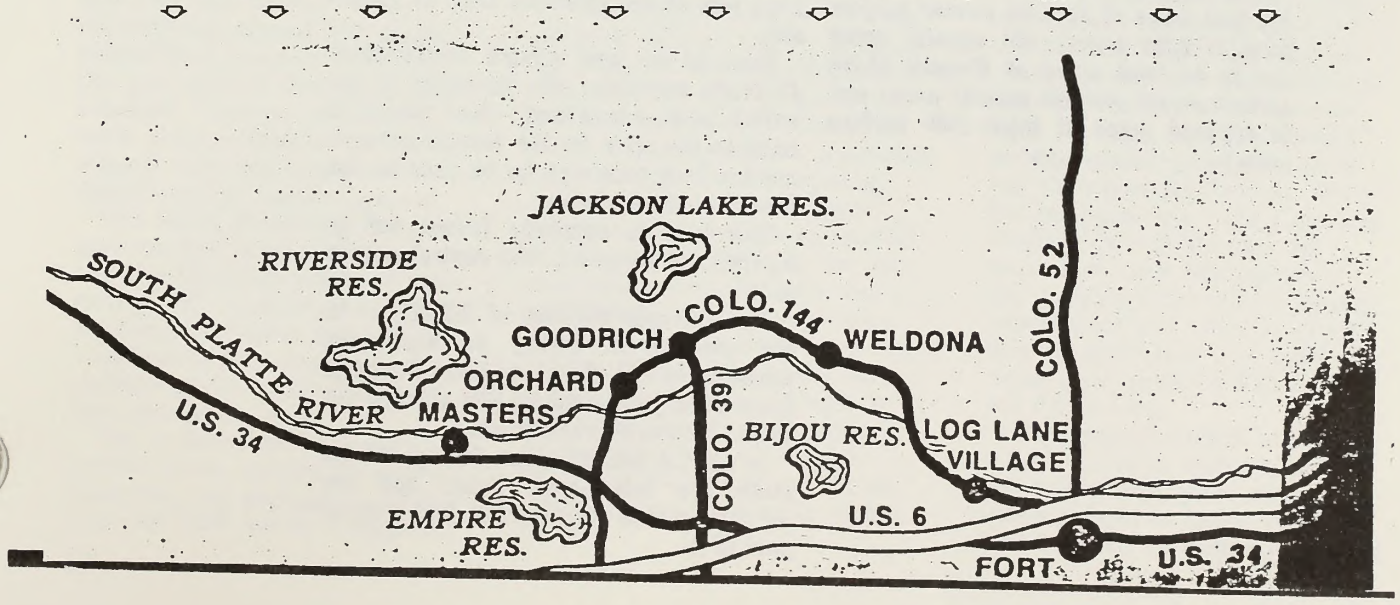
But Osborne takes the position that the reservoir company has control over the nonirrigation activities which take place on the water or land which the company is using. He said the company is opposed to unlimited and uncontrolled public use.

He said the company has trouble maintaining its dikes because of loose, sandy soil, and water disturbances from boats or land travel in vehicles poses a maintenance problem. Also, he said, such activities are "dangerous" in places.

Osborne said the reservoir company has leased hunting and fishing rights to the Riverside Duck Club for a "token" fee all these years because "they're a very limited organization" which poses no problems.

"We might be able to get $5,000 to $10,000 for a hunting or fishing lease, but

Continued on Page 27 BB



Hunting Likely Out At BLM's Riverside

Continued from Page 26 BB

we don't try," he said, "because we don't want to be (accused of) trying to profiteer by it."

OSBORNE BELIEVES the reservoir exists now and should continue to exist more as a "game refuge" than a hunting area.

"Actually, hunting on a lake like that isn't too good," he said. "But the lake provides good hunting in the surrounding land when the birds go out to feed."

Osborne didn't flatly discount the possibility of some limited, controlled public use of Riverside, but added that the state Division of Wildlife itself is "limited" in the supervision it can provide over such use.

Riverside is one of four northeastern Colorado reservoirs for which the BLM intends to draft habitat management plans.

The other three are Jackson Reservoir north of Goodrich; Empire Reservoir, a few miles southeast of Riverside Reservoir, and Bijou Reservoir, about 10 miles east of Empire. With Riverside, these three lakes form a kind of rectangle which is one of the keys to the wintering waterfowl population in that part of the state.

But of the three, only Jackson provides significant public hunting and fishing. The state of Colorado owns or has agreements to use land at Jackson, and much of the shoreline is operated as a state recreation area by the Division of Parks and Outdoor Recreation.

BLM owns 1,855 acquatic acres and 15 dry-land acres at Jackson (water surface there is 2,400 acres), 890 aquatic acres and 25 dry-land acres at Empire (2,680 surface acres) and 260 aquatic acres and 20 dry-land acres at Bijou (680 surface acres).

Most of the hunting and fishing at Empire is private, not public, and all of it is private at Bijou (although some land might be open with permission). At Bijou, the BLM acreage is mostly covered by water and all of it is cut off from public road access.

AT EMPIRE, HOWEVER, there is a point of public access on the east side which leads to part of 160 acres of land "withdrawn" from BLM to the Colorado Division of Wildlife. BLM has given over management of the land to the division, but BLM still maintains ownership. The access road runs east from Colorado 144, which runs north and south on the east side of Empire. Again, a hunter or fisherman would do well to acquire a map from BLM, from the wildlife division, from the U.S. Geological Survey or the state cartographer's office before venturing into Empire.

The wildlife division land isn't identified as such with signs. One division official said the reason is that the division has been negotiating to acquire more land in the area, and didn't want to erect signs until the deal was complete.

Another division spokesman said there have been some signs in the past, but they have been torn down by adjacent private landowners. He also said the division is reluctant to put up others because of a lack of parking space for public vehicles.

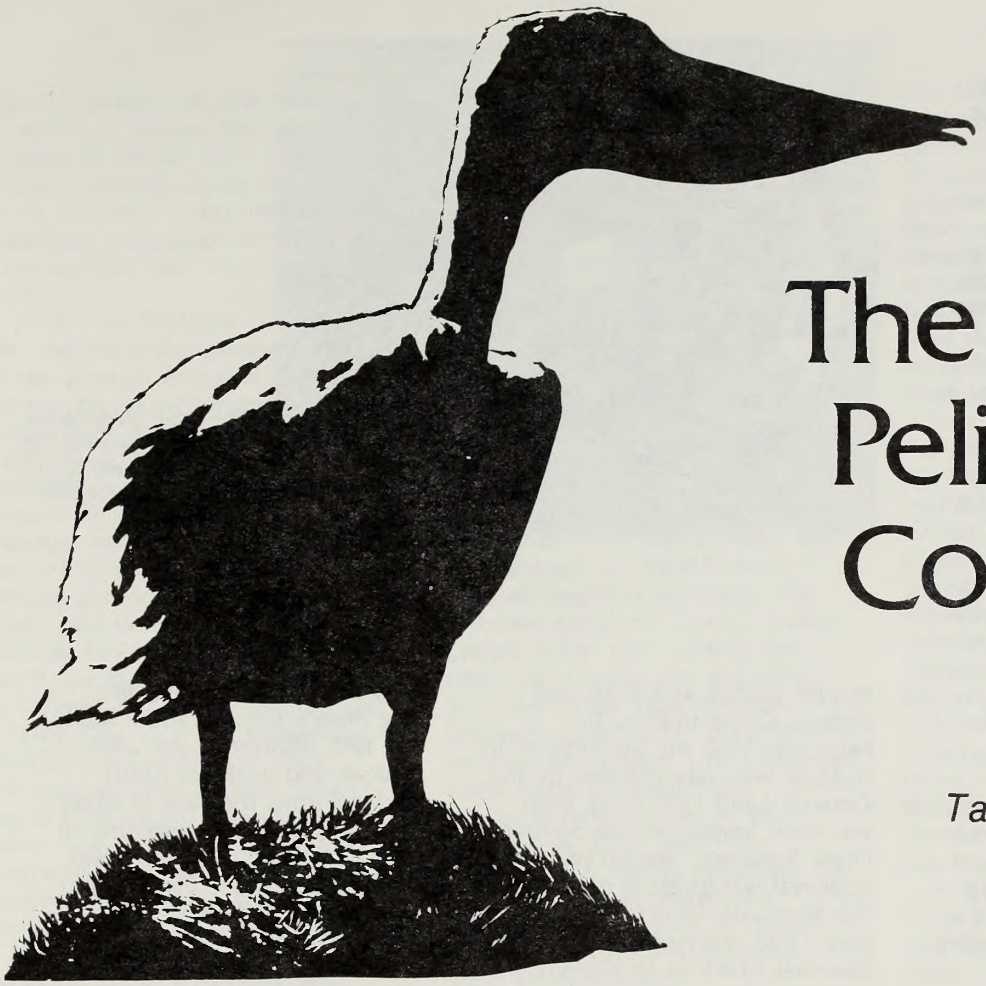
ONCE ON EMPIRE, a hunter or fisherman seeking to use public land would be in essentially the same situation as he would be at Riverside: The BLM land covers only part of the reservoir and even less of the shoreline than at Riverside.

Some of the land around northeastern Colorado reservoirs like Riverside is so-called "state school land"—land placed in trust to the state by the federal government a long time ago, to be used to the benefit of state schools.

This land is normally leased out to agricultural interests, who control access to it.

The Colorado Division of Wildlife is in the process of trying to work out agreements with the State Land Board to lease or acquire some of this acreage for public outdoor-recreation use.

In all, 2.8 million acres throughout the state are school-trust land, and the acreage around reservoirs is just a small part of it.



The White Pelican of Colorado

The Unique White Pelican Requires Tactful Management.

EVALINE A. OLSON
Colorado State Office

Throughout the empty days of winter, small island, located in the Riverside Reservoir on the high plains of Colorado in Weld County is alternately buffeted by angry, wind-whipped waves, or locked in the icy grip of winter. Here, just east of the Rocky Mountains, spring comes and goes almost daily from early March until the end of May. Sun-warmed days seesaw with chilled, cloud-filled, blustery ones until the gray cold of winter has been subdued. Weather or no, at some point, a hidden catalyst triggers bird migrations to this island summer nesting ground.

The island environment has survived the ravages of winter and the thrashing waves of early spring. Still, its ability to host arriving water birds will be impaired in proportion to damage sustained by the island from winter's turbulence.

This is Riverside Reservoir's Pelican Island, unique not only to Colorado, but perhaps to North America. Each spring it becomes a multiple habitat, shared by the great blue and the black crowned night heron, the snowy and the cattle egret, the California gull and the double crested cormorant, all dominated by the unexpected splendor of the white pelican, majestic in flight and a hopeless clumsy comic on the ground.

Amazingly, there is — from poolside to high rise — housing for all at the Riverside Waterbird Hilton. When spring signals the invasion by summer residents, there is a noisy chatter, a pushing and shoving by early arriving courtship groups, each determined to secure a choice spot in the crowded facility. As the new tenant moves in, the territory is established in whatever nesting area suits the requirement of the species. It may be on the bare ground, in willows, or high in cottonwood trees, stark and leafless after winter's assault. When all the species arrive, an ornithological metropolis comes to life!

The males bring precious gifts — twigs, rocks, and other nesting materials gathered from the island debris to be used in the building of nests.

The island is small, a scant three acres, so space is cramped for so great a number of birds having such diverse needs. How they divide the resources, how they share their nesting areas, food sources and flight space causes one to wonder if man could not learn something about coexistence through a study of these winged creatures as they work out their crowded lifestyle. Wildlife biologists from the Colorado Division of Wildlife and the Bureau of Land Management are studying these unique habitat experiences and without exception all agree that they have never seen anything like it in any other area.

The unusual aspects of nesting on the island is underscored by the beauty and grace of the white pelican in flight. This is an island colony of fluttering, mobile

and inter-related beauty, supplying the needs of many water birds.

High in gnarled old cottonwood trees, double crested cormorants and black crowned night herons flutter restlessly as they establish nesting places for the weeks ahead. Their roosting forms etch an irregular silhouette against the snow-capped Rockies to the west. Suddenly, as though in response to a command brought by the wind, the birds soar skyward and then as suddenly plummet back to take possession of half-completed nests in the trees. A clatter ripples through the colony and fades away as the birds fussily rearrange a few twigs in their respective nests before settling down.

In a willow, a snowy egret daintily preens her feathers then resumes her nest building. Through high-powered field glasses the white pelican is seen to dominate the bare ground nesting sites. Altogether they make a writhing carpet of white as they make their preparations to raise a new brood with the coming spring.

Occasionally, six to ten pelicans, awkwardly "grounded" until the sun-warmed land and water surface produces flight sustaining thermals, clumsily lift off for reconnaissance flights around the island. These flights seem to serve no purpose except to break the monotony of nest building. Barely clearing the trees, they return to the nests to resume the important task of preparing for the next generation. The chicks will come out of their shells completely naked. When they are about half grown, dense white down will cover their bodies, and they will move out of the nests to spend the hot periods of each day in the cooling shade of the willows and other low shrubs.

An air of tranquility, yet charged with purpose, pervades the island from the pelican colonies on the ground to high nesting species like the cormorant.

Riverside Reservoir is underlain by a mixed land ownership of private parties and state and Federal Governments. In February, 1898 the application for right of way was granted by the General Land Office for what was then known as the Sanborn Draw Reservoir. Eleven years later, approval was given to merge into the Riverside Irrigation Company. The reservoir performs an essential function in providing water to thirsty crops grown on eastern Colorado's semi-arid plains.

The adult birds range over a wide area to find the fish needed to sustain themselves and their young.

The white pelican arrived in Colorado and established its nesting area at Riverside Reservoir in 1962. Since their arrival, their habits have been studied each year by the Colorado Division of Wildlife and Colorado State University.

Riverside Reservoir is the only nesting area for the white pelican in Colorado. Migrating birds have used Antero Reservoir in central Colorado as a resting and feeding ground, but for some reason, the birds have rejected Antero as a nesting site. One purpose of current research into the life of the white pelican is to provide a management program that will insure that the birds continue to nest in the State.

At one time the white pelican was on the State's endangered list. While there is no immediate danger of losing the bird as a breeding resident at this time, the Division of Wildlife keeps the bird on its "threatened list." The State's Conservation Stamp for 1975 illustrated the white pelican and nominal funds derived from the sale of these stamps were made available in 1976 to rehabilitate the island, badly deteriorated by strong wave action. In an earlier attempt to reinforce the island's shoreline, conservation groups throughout the state, the Audubon Society and students from Colorado State University contributed time, money and heavy equipment.

After that the island remained in a relatively stable condition for a few years, but the relentless wave action continues as a constant and destructive force, particularly affected by the fluctuation of the water level as water is impounded and then released for agricultural irrigation. In addition, boaters have had limited access to the reservoir. Under these conditions, the burlap used to rip rap the island lasts only about two years and then begins to allow fine silt to be washed through the mesh and undercut the islands. All boating is discouraged and will be carefully regulated or eliminated through a cooperative management agreement with Riverside Irrigation Company, the Riverside club that leases sporting facilities at the reservoir, and the government agencies. No boat-

ing is permitted on the reservoir at any time during the nesting season. There has been a cooperative attitude on the part of all involved to nurture the waterbird population and provide protection for the nesting pelicans.

While the Division of Wildlife continues the management of the pelican population, the Bureau of Land Management is responsible for the management of the island habitat. BLM administers millions of acres of Natural Resource Lands between Mexico and the Arctic Ocean, but the Riverside site is the only nesting ground for white pelicans under the Bureau's jurisdiction. Wildlife biologists at BLM's Northeast Resource Area Office at Golden, Colorado have worked side by side with the Division of Wildlife personnel ever since the pelicans first arrived. Banding of young birds, monitoring the flock, evaluating and making recommendations regarding the quality of the island environment are continuing programs.

BLM's involvement in this program began when the white pelicans selected the island, which is National Resource Land for their nesting site.

The island could have been exchanged for private lands, but BLM considered the nesting ground a valuable natural resource. Both pelicans and the public have benefited by BLM's progressive and positive management role.

The pelican is extremely sensitive about its nesting environment. Well established studies of the bird throughout North America show that human disturbance is the single greatest cause for the birds' abandoning nesting areas. To prevent this and other disturbances BLM and the Division of Wildlife have worked together to control not only the use of the island but also certain lands surrounding the reservoir. During the breeding and egg-laying season even biologist working on the project have to be content with observations made through high-powered field glasses or telephoto lens. Only after the incubation is nearly complete do the biologists approach the island, and then only in unobtrusive and carefully manipulated floating blinds.

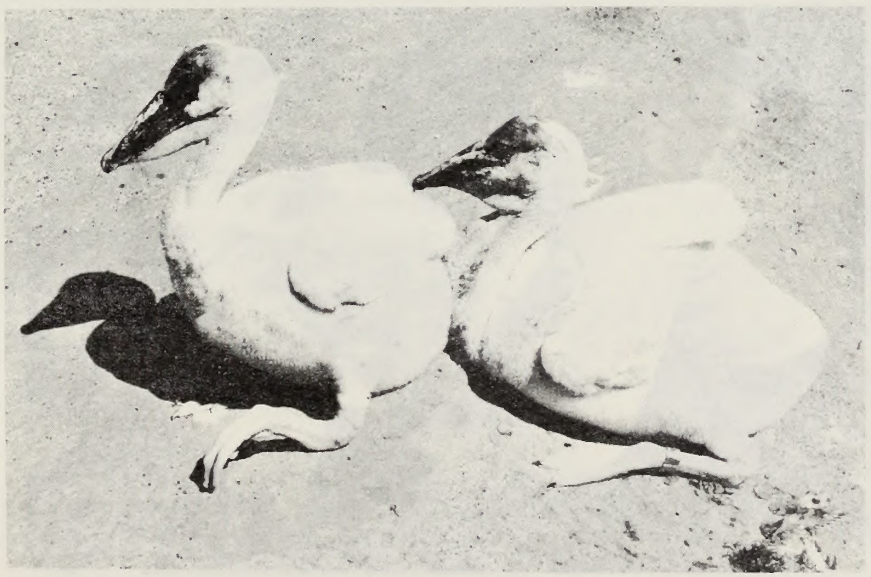
The pelican required an island environment to satisfy his need for safety through isolation and also the proximity to enormous quantities of carp and other non-game fish to sustain its 15- to 30-pound body and the ravenous appetites of its young. Riverside Reservoir is ideally located in a network of other reservoirs, including Latham, Empire and Jackson. The great birds range over these areas averaging 35 miles on daily sortees to collect their food.

To alleviate the overcrowding of Pelican Island at Riverside, wildlife biologists constructed a new island on Latham Reservoir near Greely, Colorado. With the assistance of personnel from the Canon City District Office of the Bureau, 20 juvenile birds were trapped and transported to Latham Island. Since the birds do not breed until they are three years old, it is too early to tell whether the young birds have taken the Latham Island imprint. Biologists are encouraged over the fact that young pelicans did use the new island in 1975.

In the spring of 1976 students from Colorado State University and Boy Scouts in the area put in many hours clearing the vegetation from Latham Island. The pelican requires bare ground for nesting. Snow goose decoys were placed along the shore of the island to attract the pelicans. In June 8 young pelicans were seen using the island.

BLM's Canon City District will prepare a wildlife habitat management plan for the pelicans in cooperation with the Colorado Division of Wildlife. The plan will provide on-the-ground wildlife enhancement and protection for the birds. It may include other reservoirs in the area where state/federal wildlife responsibilities and land ownership are involved.

Long-term objectives include plans for the pelican, shore birds, and other wildlife through continued rebuilding and maintenance of the existing island and possible development of a new island within Riverside Reservoir. A promontory on the northwest shore is being studied to see if it could be separated from the shore line and stabilized to provide additional nesting



The young are born without feathers and are dependent on parental care. One fledgling shows an identifying band.

habitat at Riverside reservoir for the pelican and other ground nesting birds of the area.

As the plan develops, existing sloughs and canals could be protected and new ones designed to attract non-game wildlife, small mammals and birds while newly created marshes could attract a variety of ducks. Before such a major redevelopment of the area can be programed it will be necessary to design hydrologic simulations to determine what effects the fluctuating water levels of the reservoir will have and to determine if there is sufficient ground water to support a marsh and bring water to the canals through the hot dry summers.

If the natural ingredients are there to support the development, it may be possible to achieve results as successful as those at Cheyenne Bottoms of Kansas — but on a much smaller scale.

At Cheyenne Bottoms, the State of Kansas bought 20,000 acres within a natural sink and flooded 12,000 acres of this with water from the Arkansas River and other local streams. Five pools, now having a depth of 3 to 4 feet, have attracted millions of shore birds and at least a half-million ducks during the peak of the fall migration. Three of the pools are open for public use; two have been set aside as a wildlife refuge.

At Cheyenne Bottoms the shallow pools provide an abundance of waterfowl food. This food has attracted about 700 white pelicans who spend the summer at Cheyenne Bottoms feeding and resting.

In 1962 a count was made of the pelicans in the Riverside colony. The count showed 250 adult birds. There are now close to 500 birds composed of 220 breeding pairs and 60 young non-nesting adults at the reservoir. In 1976 a major effort was made to accurately count adults and the season's hatch. Intricate timing is required to get an accurate count in both of these categories. The first census taken in May was aimed at counting the adult population. Biologists flew over the area in early morning when the females were on their nests and before the chicks had hatched. At such an early hour thermal updrafts had not developed to enable the males and other non-nesting adults to fly from the area.

In mid-summer an accurate count of the young birds is made. An overflight is timed later in the day when the adults have left the nests for a day's fishing and the fledglings have clustered along the shoreline. This year 220 breeding pair produced 325 young birds.

In addition to being concerned with the pelican population, its protection and development, BLM is also concerned with appropriate use of the land for human recreation. The two concerns may appear to be incompatible, but the twin objectives can be achieved with proper management.

In Colorado there is a deep concern for the natural environment, but there is also a demand for outdoor recreational facilities. Mixing pelicans and people is a delicate matter. To provide an essential environment for the pelican it has been necessary to keep boating on Riverside Reservoir to a minimum, and now the pelican habitat provided by the reservoir has become crowded.

Recreationists see the coordinated management of Riverside with its companion reservoirs — Empire and Jackson — as one solution. Each reservoir makes its contribution to the pelican's food supply, but are also in demand for fishing and waterfowl hunting.

Under intensive management only minimum human intrusion would be allowed on Riverside and that only at times when the activity would not interfere with the pelican's breeding and nesting. The major part of the human use would take place on Empire and Jackson reservoirs, but even this use would have to be scheduled to keep interference with the pelicans at a minimum.

Colorado is a high, wide and handsome country. Its environment has been enriched by the pelican's presence. These strange birds, so awkward on foot, so graceful on the wing, challenge the creative mind to search for new horizons. Their preservation is a sacred trust and a debt we owe future generations.

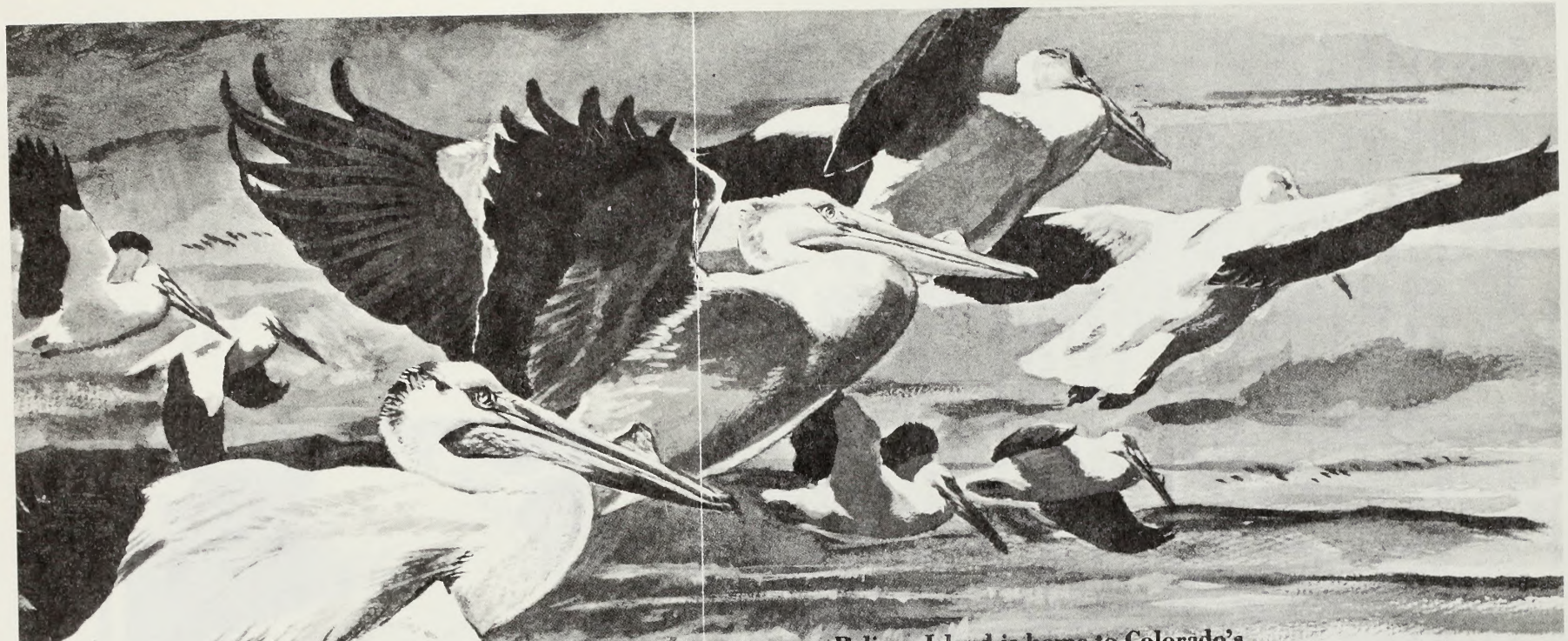
Banding provides valuable information that will be used in the future management of the white pelican population of Pelican Island.

Made in United States of America
Reprinted from THE WILSON BULLETIN
Vol. 75, No. 1, 2 April 1963
p. 92

White Pelicans breeding in Colorado.—The first known nesting of White Pelicans (*Pelecanus erythrorhynchos*) in Colorado occurred in 1962, when an estimated 200–250 adults reared about 60 young on an island in Riverside Reservoir, 3 miles north of Masters, Weld County, Colorado. Adult pelicans with small nestlings were first observed by Norman L. Hughes and William H. Rutherford, of the Colorado Game and Fish Department, during a routine aerial count of waterfowl on 29 May 1962. Young were observed from the ground on 23 July by Jack R. Grieb and Howard D. Funk of the same department. On 24 July, Ronald A. Ryder, assisted by Game and Fish Department personnel and students from Colorado State College at Greeley, banded 45 flightless, but nearly full-grown young. Ring-billed Gulls (*Larus delawarensis*) and Double-crested Cormorants (*Phalacrocorax auritus*) were also believed to have nested on islands in Riverside Reservoir, as immatures of these species were seen flying in the area 24 July, but no definite nests or flightless young were found.

Riverside Reservoir is approximately 4 miles long and 2 miles wide, with a surface area of 3,811 acres and a storage capacity of 57,633 acre-feet. The reservoir is relatively isolated and rarely visited except during waterfowl hunting seasons, when portions are leased by private gun clubs. The past two years the reservoir has been filled to near capacity, which has made its islands more isolated than in recent dry years. Personnel of the Colorado Game and Fish Department have banded flightless ducks on the reservoir every summer since 1957.

The AOU Checklist of 1957, Bergtold (1928. *A Guide to the Birds of Colorado*), Sclater (1912. *A History of the Birds of Colorado*) and Cooke (1897. *The Birds of Colorado*) all list the White Pelican as probably nesting in Colorado, but cite no definite dates nor places of nesting. The nearest known nesting colonies are in Great Salt Lake, Utah, Yellowstone Lake, Wyoming, and Bennett County, South Dakota.—RONALD A. RYDER, *Colorado State University*, and JACK R. GRIEB, *Colorado Game and Fish Department, Fort Collins, Colorado, 13 August 1962.*



Pelican Island is home to Colorado's . . .

White Pelicans

By RONALD A. RYDER

IMAGINE a small, sparsely vegetated island with a clean sandy beach. High overhead, huge white birds with contrasting black tips to their wings circle silently. As one approaches the island by boat, large sea gulls follow, scolding and diving. Ahead, goose-sized black colored birds with long, snake-like necks dive to escape our approach or flap clumsily to get airborne. Much smaller terns, snow-white with striking black caps and long, forked tails, hover over the wake we leave regularly plunging into the water to catch small minnows disturbed by our boat. Completely white herons leave the low islet as we put ashore. A tropical island landing in the Caribbean or South Pacific? Hardly. Such is the impression one gets if he participates in the annual banding expedition to

The author is an associate professor of wildlife management at Colorado State University, Fort Collins.

PHOTO BY DON DOMENICK

A white pelican gets up power for a takeoff. Pelicans are protected by federal law.

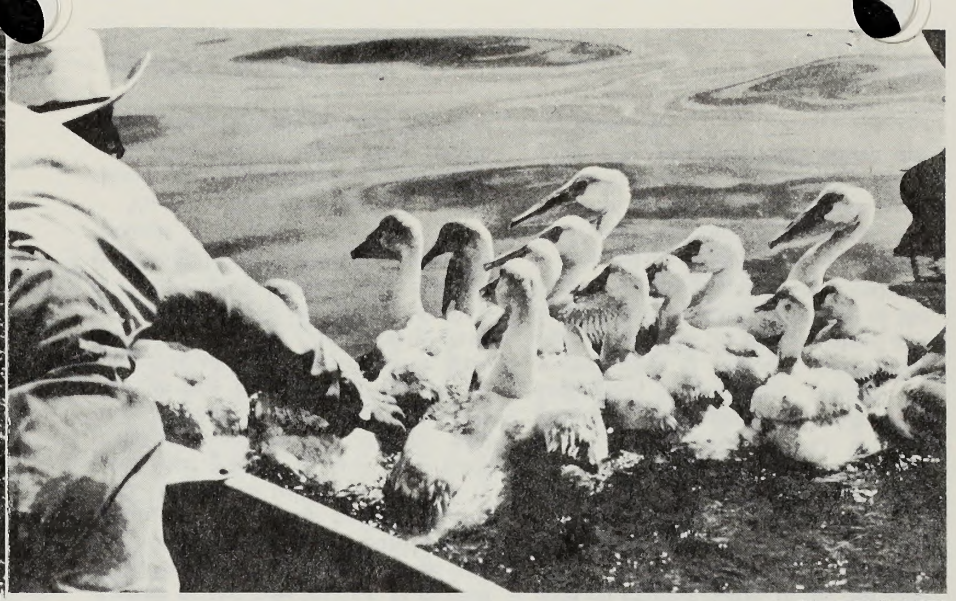


PHOTO BY JIM HITCH

Some of the younger and flightless pelicans on Riverside were captured by boat and bonded.

PHOTO BY JIM HITCH

Dr. Alfred M. Boiley of the Denver Museum of Noturol History observes o flight of white pelicans over Riverside Reservoir eost of Fort Morgan.

Pelican Island of Riverside Reservoir with its nesting colony of pelicans, cormorants and other waterbirds.

Few Coloradans realize that their state supports good sized flocks of white pelicans, one of the largest birds in North America. This solemn, dignified fisherman averages 8 to 9½ feet in wing spread and usually weighs 10 to 17 pounds although males as heavy as 30 pounds have been reported. In Colorado, only the golden eagle rivals the pelican for wing spread; only the Merriam turkey as far as weight — none rivals the pelican for bill-size!

The white pelican is a fairly common migrant, both spring and fall, stopping to rest on the larger reservoirs and lakes to feed enroute to their main nesting grounds to the north. Small colonies are resident in southern Texas and central California, but most colonies occur north of Colorado. Unlike brown pelicans, their smaller coastal cousins, white pelicans prefer inland bodies of water to the sea coast. Although a few nonbreeders remain through the summer on various lakes and reservoirs, both on the eastern plains and in the San Luis Valley, the only known nesting colony of this magnificent bird in Colorado is on Riverside Reservoir near Fort Morgan.

Residents of the Fort Morgan area report that white pelicans and other waterbirds have used the several islands of Riverside Reservoir for years — at least for loaf sites if not as regular nesting grounds. In late May, 1962, Norman L. Hughes and William H. Rutherford of the department, observed adult pelicans and small nestlings on a low, sandy island there during a routine aerial count of waterfowl. Young pelicans were observed from the ground July 23, 1963, by Jack R. Grieb and Howard D. Funk, and 45 flightless, but nearly full-grown young, were banded the next day by the author assisted by department personnel and students from Colorado State College. From this limited banding, three recoveries have been reported—one near Henderson, Colorado; another near Vera Cruz,

PHOTO BY JIM HITCH

Art Gresh, WCO at Greeley, assists Professor Ron Ryder of CSU in banding a baby pelican.

Mexico; and a third on the Texas Gulf Coast. This past summer, another 44 young pelicans were banded, so in years to come we should know more regarding the migration of birds from this colony.

This past year, the nesting colony at Riverside Reservoir was followed much more closely — generally by observers using telescopes to minimize disturbances. The pelicans arrived early in April and were nesting by the end of the month when Donald Davis, a CSU graduate, observed eggs in 55 pelican nests. Most contained 2 eggs, a few only one and one nest contained 3 eggs. Double-crested cormorants and California gulls were nesting at that time also. Later in the summer snowy egrets (a small white heron), Forster's terns and red-winged blackbirds also nested on the island which at high water level is only about 210 by 180 feet. During the peak of the nesting season, an estimated 375 birds of six species (adults and young) crowded on to Pelican Island — an area about the size of 4 tennis courts. The bickering and bill snapping was terrific. Gulls, magpies and crows continually were on the lookout for unprotected nests from which to steal eggs. Few sights can rival the beauty of over a hundred pelicans soaring on broad, black tipped wings in an azure blue sky. Add to this the immaculate white flurry of egrets and the marine-like sound of scolding gulls and one can truly imagine being on a tropical isle.

Most of the inhabitants of Pelican Island rely upon the productive waters of Riverside and nearby reservoirs for their livelihood. The pelicans and cormorants feed largely on rough fish such as carp and suckers whereas the egrets, gulls and terns take minnows and smaller aquatic prey. The gulls are great scavengers as well as egg-stealers and, of course, eat great numbers of earthworms and insects especially in newly plowed fields. In freshly irrigated meadows, gulls catch considerable numbers of mice and other rodents.

White pelicans capture fish from the surface in several rather ingenious ways. At times several pelicans will form a line, side by side, and swim rather rapidly into a shallow bay intermittently dipping their heads under and out of the water. When a school of fish is encountered the line is usually closed upon itself even forming a circle at which times all pelicans immerse their heads and scoop up fish in their cavernous bill pouches. While fishing, pelicans often cause quite a commotion with their legs and half-opened wings as if to frighten the fish to surface. An amazing degree of social cooperation is shown as the birds respond together as if by visual signals. Pelicans are strangely silent and apparently utter no vocal sounds in these fishing forays. At other times a lone pelican might be seen fishing in deeper water by thrusting its bill deeply as the bird swims slowly along. This surface fishing is in marked contrast with the power-dive, aerial fishing of the brown pelicans found on either coast.

The elastic skin of the pouches and hooked bills permits the pelican to grasp rather large fish. Fish are not carried in the pouches but swallowed headfirst when the bill is raised and the water allowed to run out the sides of the bill. After the pelican literally gets "a stomach full" they fly back to feed their young. At first the freshly hatched young are fed a fairly well digested fluid which the parents "cough up" but later the parents regurgitate almost intact fish — or more often, the larger young nearly crawl into their parents' throats seeking such a meal. During banding we frequently saw young pelicans disgorge carp 2-4 pounds in weight!

Young pelicans are hatched, naked, blind and quite helpless, resembling ugly little rubber toys. They remain on the low mounds of sand that serve as nests until about a third grown at which time they are covered with a dense white down which gives them the appearance of wearing long underwear. They then form small groups called pods and seek shade under the low willows on the island. The young flutter their throat pouches to try to get rid of heat during midday and crowd together when it is cool.

In addition to the remarkable throat pouch, white pelicans have several other unusual anatomical features, notably pneumatic padding, totally webbed feet and a strange "sail" on the top of the bill. The spongy, air-filled tissue under the skin seems to be a carry-over from some plunging ancestor like the modern brown pelican. All four toes of each foot are joined by webbing which permits the white pelican to swim easily. During the breeding season both sexes of the white pelican sport a fibrous, horny, roughly triangular "sail" on the top of the upper mandible. It usually is about 2 inches at the base and about 1½ inches tall. The function of this secondary sexual feature is unknown. The sail is shed after incubation commences.

Most of the pelicans I haxe examined on Pelican Island, in the San Luis Valley and in Utah, have harbored large, flat bird lice in the mouth and throat which feed upon their hosts' blood. Various internal parasites such as roundworms and tapeworms are rather prevalent also. Dr. O. Wilford Olsen, parasitologist at Colorado State University, took blood samples of numbers of pelicans, cormorants, egrets and gulls on Pelican Island and found them all remarkably free of the blood parasites that cause bird malaria.

Coloradans should be proud of their prairie bird city on Pelican Island. No other place in the state harbors such an assemblage of large, showy birds. May it be protected from undue disturbance. ◆

Reprinted from THE CONDOR, Volume 66, September-October, 1964, Number 5, pp. 440–441

California Gull Nesting in Colorado.—Until 1961, the California Gull (*Larus californicus*) was considered only a casual visitor in Colorado (Bailey and Niedrach, Birds of Colorado, in press). Only two authentic specimens were known as of 1961, although I have since collected four California Gulls in the Fort Collins area. Since 1952, numerous sight observations have been made in north-central Colorado, both on the plains and in North Park. Most sightings have been in the late spring and early fall but there are a few in July and August and others in March and November.

California Gulls are common nesters on Bamforth, Twelve Mile, and Twin Buttes lakes near Laramie, Wyoming, as close as 25 miles to Colorado. Therefore, it is not surprising to find this species increasing in Colorado. In the course of capturing Ring-billed Gulls (*Larus delawarensis*) and Herring Gulls (*Larus argentatus*) with a cannon-net trap near Fort Collins, I banded five California Gulls on Timnath Reservoir in September, 1962; 27 were banded from a flock of about 200 on April 23, 1962, and one was banded on October 2, 1963. All gulls banded in 1963 were dyed yellow with picric acid. In May and June of 1963, at least nine of these color-marked California Gulls were seen in or around the nesting colonies near Laramie and one on Pathfinder Reservoir near Casper, Wyoming. Three of the dyed gulls near Laramie were either incubating or brooding young according to Dr. Kenneth L. Diem of the University of Wyoming. One banded adult California Gull was recaptured at Timnath Reservoir on October 30, 1962; this bird had been banded as a fledgling at Bamforth Lake on July 4, 1958, by Dr. Diem.

On April 28, 1963, Donald G. Davis found five gull nests associated with 55 White Pelican (*Pelecanus erythrorhynchos*) nests and three Double-crested Cormorant (*Phalacrocorax auritus*) nests at Riverside Reservoir, Weld County, Colorado. The gull clutches were incomplete at that time, and there seemed to be many pairs of gulls that had not yet begun to lay. The species of gull involved was not then determined, although eggs measurements fell within the proper range for California Gulls rather than for the Ring-billed Gulls. Nesting of the pelicans has been described by Ryder and Grieb (Wilson Bull., 75, 1963:92).

Observations of the nesting colony by the author on April 29 and May 18 verified that the gulls were California Gulls. Alfred M. Bailey, Arthur Gresh, James Hitch, and the author visited the colony on June 28 to band and photograph at which time an estimated 50 pelicans, 10 cormorants, and 100 gull young were practically fledged. Ten nests of Snowy Egrets (*Egretta thula*) were found in low willows on the island. At least one pair of yellow-dyed California Gulls defended several downy young that swam away. These dyed gulls had initially been captured and released near Fort Collins approximately 45 miles to the northwest some three months earlier. On July 1, Charles R. Hayes and Charles E. Graham saw "ten or twelve yellow gulls" in the Riverside Colony. Six nests of Forster Terns (*Sterna forsteri*) containing one to three eggs each were found on subsequent visits to the colony on July 11 and 22. In all, 22 California Gulls, 44 White Pelicans, 8 Double-crested Cormorants, 46 Snowy Egrets, and two Forster Terns were banded on the island in 1963. The fledgling California Gulls were dyed red. At least two of these marked gulls have been observed near Greeley and Loveland to the west.

This is apparently the first record of the California Gull nesting in Colorado and represents a southeastward extension of the breeding range. In 1962, the island was not visited until late July at which time any young gulls that might have hatched that season had probably departed. In 1961, Richard M. Hopper reported flightless gulls (species unknown) on the island. In June and July of 1962 and 1963, Ring-billed Gulls, both immatures and adults, were noted flying and feeding in fields near Riverside Reservoir. None was seen in the Riverside nesting colony although a few nest near Laramie. Carl Maag, local caretaker for the Riverside Gun Club, relates that pelicans, gulls, and other waterbirds have nested intermittently on the island for the past 15 years, perhaps longer. Thus, California Gulls have probably nested in Colorado prior to 1963 although no authenticated records are known.

The marking and banding studies were financed by grants from the Colorado State University Faculty Improvement Committee, to whom I am grateful.—RONALD A. RYDER, *Colorado State University, Fort Collins, Colorado, November 28, 1963.*

BANDING STUDIES OF WHITE PELICANS NESTING IN COLORADO

by

Ronald A. Ryder, Colorado State University

Since 1962, 636 white pelicans have been banded at a nesting colony on Riverside Reservoir in Weld County, Colorado by Allegra Collister and the author assisted by students from Colorado State University and the University of Northern Colorado. The number of young pelicans banded has varied from 27 in 1964 to 154 in 1970. As of 23 April 1971, 21 recoveries of these bandings have been reported: 6 from Mexico, 6 from Colorado, 2 from South Dakota, and 1 each from Alberta, Arizona, Idaho, North Dakota, Texas, Utah and Wyoming. Apparently most of the pelicans nesting in Colorado winter along the Gulf of Mexico. Subadults seem to wander widely and some, at least, eventually nest in colonies to the north and west of Colorado. The pelican colony at Riverside Reservoir has increased in size rather continuously since 1962 and, in spite of various pesticides detected in fat samples collected from flightless young, has experienced better than average nesting success.

Abstract of a paper presented at the 42nd Annual Meeting of the Colorado-Wyoming Academy of Science held in Pueblo, Colorado, April 30, 1971

Such a beautiful bird is the pelican

Colorado's only nesting white pelicans are alive and well in Weld County.

A total of 296 young pelicans were banded last week at Riverside Reservoir 30 miles east of Greeley.

Banding of the 4-6-week-old birds has taken place in mid-June each year since they were discovered nesting on an island in the huge prairie reservoir in 1962.

Pelicans nest in shallow depressions containing a few sticks in the sand. Beach space for nests is shared with the California gulls, which also breed on the island. Inhabitants of the trees on the isle include double-crested cormorants, great blue herons, black-crowned night herons and at least one great horned owl.

Adult pelicans, whose wingspans can reach nine feet, have moved into the interior of the U.S. as the number of manmade reservoirs increased. The big, birds, white with black wing tips, feed on fish, mostly carp caught and regurgitated for the young upon the return to the nest.

As the banders in two boats moved close to the island, the adult pelicans took to the air, screaming at the intrusion.

Once on the island, the banding goes at a fast pace. Catchers go after the young birds as they huddle amongst the willows. In little more than an hour, almost 300 of the toddlers are marked with aluminum bands attached to their legs.

In 13 years of work at Riverside, 1,556 pelicans have been banded. According to Ron Ryder, a CSU professor who was one of the discoverers of the birds in 1962, about 30 of the bands have been returned. Returned bands indicate adult pelicans winter in Mexico and that the sub-adults wander all over — from Saskatchewan, Can., to Florida.

The population at Riverside has shown a slight increase the last three years. Some 239 were banded in 1972; the 1973 total was 254; and this year's count jumped to 296. Only 44 young were banded in 1962.

John Torres, chief non-game biologist for the Colorado Division of Wildlife, was in charge of the island expedition. He and Ryder handled the banding while conservation officers Courtney Crawford of Greeley, Howard Spear of Ault, Brett Petersen of Fort Morgan, and Mike Babler of Longmont handled the bulk of the catching.

Greely Tribune June 18,1974

Colorado does have pelicans. To retain them will take time, effort and money, and Colorado's 1975 wildlife conservation stamp will call attention to this

By JOHN TORRES
Nongame Wildlife Supervisor

EARLY one May morning in 1962, two Division of Wildlife employes conducting a routine aerial waterfowl count in northeastern Colorado, came upon an unusual flock of birds they had never before observed. Norman L. Hughes, the pilot, and William H. Rutherford, the observer, could not believe their eyes on their first encounter with these strange white birds of enormous size. Several days prior to the discovery the Division had received a report from an anonymous sight-seer who indicated he had observed several large birds resembling pelicans in the area of Riverside Reservoir in northeastern Colorado. The confirmation of this report began what would later become an unusual and interesting investigation into the life of this unique species, a new state resident.

Few Colorado residents are yet aware that Colorado supports a viable population of white pelicans, the largest bird to ever rear young in the state. This quiet graceful flier has a wing spread of almost ten feet and weighs as much as 30 pounds. It is a very efficient fisherman and seems to thrive on the abundant rough fish supply such as is found in Riverside and other reservoirs and lakes in the eastern part of the state.

The white pelican has become a rather common migrant, passing in and out of the state in the spring and again in the fall. It prefers the larger bodies of water to rest and feed on as it migrates toward the historical nesting grounds to the north. Although small colonies nest in southern Texas and central California, most colonies are found north of Colorado.

Unlike the smaller brown pelicans who spend their entire life on the sea coast, white pelicans prefer fresh inland waters. Nonbreeding birds are often seen on several lakes and reservoirs in the San Luis Valley, on the

eastern plains, and more recently at Antero Reservoir in South Park. To date, the only nesting population of this attractive bird is on a large island on Riverside Reservoir, 24 miles east of Greeley.

During mid-summer of 1963, the first young were observed by Division biologists Jack Grieb and Howard Funk. Shortly thereafter a crew of biologists headed by Doctor Ronald A. Ryder, associate professor of wildlife management of Colorado State University, banded 45 nearly full-grown young that were still unable to fly. Since then banding of pelicans (and other water birds) at Riverside has continued each year. Nearly 1,000 total pelicans have been banded since their discovery in 1962. We know of 25 recoveries to date, scattered from Alberta, Canada to Veru Cruz, Mexico. Most winter recoveries have come from Mexico where most pelicans are now known to spend the colder months of the year. Much information, which is important to the management of this species, has been obtained through the banding program and other similar studies.

A study designed to evaluate the effect of agricultural pesticides on the reproductive ability of the white pelican has also been in progress for several years. Since the brown pelican population had nearly succumbed to such pesticides which were being used indiscriminately, it was suspected that perhaps the white variety may also be victimized. It was at this time that Dr. Bert Thomas, associate professor of biology at the University of Northern Colorado at Greeley, undertook the task of determining the effect of the chlorinated hydrocarbons and more persistent pesticides on the life cycle of the white pelican. Fortunately, the levels of these toxic agents in the body tissue of the Colorado pelicans was found to be minimal and has had no

PHOTO BY DON DOMENICK

Some wary white pelicans beat a hasty retreat to their island at Riverside Reservoir in northeastern Colorado. White pelicans fish on the surface in contrast to the brown pelican's aerial dives.

apparent effect on eggshell formation or other reproductive processes. This year a new chemical analysis technique will be applied which uses the eggshells that remain from unhatched eggs. With this process, the egg material can be quickly analysed for pesticide content and will prevent any disturbance or harassment to the birds.

The original island in which the pelicans first nested has been destroyed by water and wind action. It is now almost completely under water and no longer can be used by nesting birds.

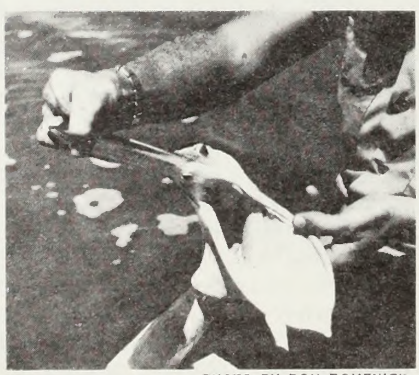


PHOTO BY DON DOMENICK

The pelican's hooked bill and elastic pouch enable it to catch large fish. Note the large bird lice parasites within pouch.

The flock was forced to shift to the south end of the reservoir where they nest on a larger island under several tall cottonwood trees. The second island was also almost totally eroded away in 1973; however, with the assistance of several members of the local Audubon Society and Sierra Club, heavy equipment was quickly employed to restore this important body of land. The birds have since returned and apparently accepted the reconstructed island, as evidenced by this year's record production of young.

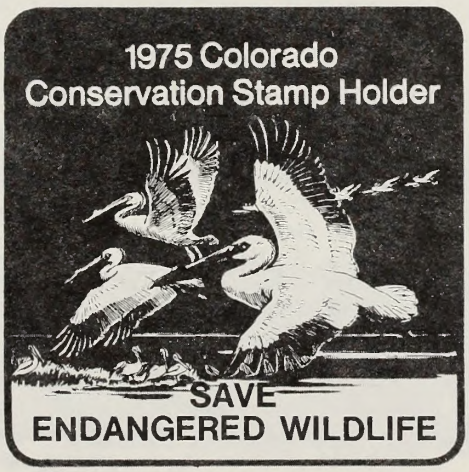
Each year the already crowded island becomes more congested since not only does the pelican nest here but so do a variety of other water birds. One may easily count a hundred California gulls on the island at one time with an equally high number of snowy egrets, double-crested cormorants, Fosters tern, black-crowned night herons and the larger great blue herons. Many other species of birds nest and feed in and along the shores of this large reservoir. The beautiful summer setting provided by the heavily vegetated island surrounded by azure-blue water of the reservoir, is often said to compare to a tropical islet landing in the Caribbean.

More recently, in June of 1974, an

effort to entice pelicans to nest on Lower Latham Reservoir southeast of Greeley was undertaken. A virgin island was constructed during a period when the reservoir had been drained for repairs on the spillway. The island was seeded and vegetated with willow cuttings and other native plants to provide immediate protection from the erosive winds and waves common to this body of water. Later in the summer, 14 flightless but nearly grown young were captured at Riverside and brought to Latham where they were released. Personnel of the U.S. Bureau of Land Management provided manpower and equipment to facilitate the trapping and transplanting venture. The newly released birds were monitored by biologists of the BLM and the Division until they were able to fly and later joined the others for the long migration south.

The plan objective was that the transplanted young would imprint to Latham Reservoir and upon returning to the area in the spring would bring other pelicans with them. Hopefully, the visiting birds will be looking for a place to nest and will select the new island as a suitable site. Such an accomplishment would help increase the population of the white pelican which is considered threatened in Colorado. If successful, similar projects will be attempted in other areas of the state in an effort to develop a self-sustaining population of these beautiful birds so that their chances of survival will no longer be threatened.

The white pelican is an intelligently interesting bird. It catches its food by fishing the surface in what appears to be planned strategy. One technique is that of several birds lining up abreast of each other and swimming at a high rate of speed toward a shallow sand bar or bay, dipping their heads in and out of the water as they move. When a school of fish is observed, the birds form a circle and completely surround the fish in quick fashion. Their heads are then immersed into the water and scoop up the prey which is held temporarily in the bill pouches. Pelicans are unusually silent and apparently utter no sounds during the fishing display. At times, one may observe a lone adult pelican fishing in the deeper waters by dipping its bill well under the surface as it swims lazily along. Unlike the brown pelican of the coast, the white pelican does not engage in aerial fish-



Colorado's 1975 wildlife conservation stamp portrays the white pelican in full color. Black and white reproduction above is actual size. A distinctive two-color decal (left), measuring 3½" x 3½" will be given with each stamp. Cost of stamp is $5.00. Money will go for nongame and endangered species.

ing or sky-diving into the water to capture its prey.

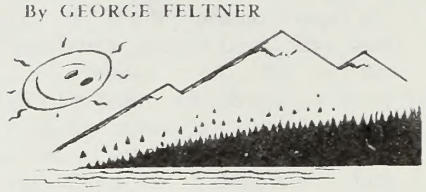
The elastic skin of the pouches and curved bills provide the bird with an excellent tool for snatching sizeable fish. Captured fish are not held in the pouches for very long but swallowed headfirst by raising the bill allowing the water to escape out the sides while the fish enters the throat. When the pelican has gorged itself, it struggles to get airborne to fly back to feed its young. In seeking their meal the young put their head entirely inside the parent's pouch and throat appearing to about be swallowed by the adult bird. The young pelicans have a voracious appetite and can devour a three- to four-pound carp in minimal time.

A female pelican will usually lay only two eggs, sometimes three. The grotesque young are hatched completely naked and are blind. They depend entirely on the parent for protection and sustenance for the first few weeks. The young remain in the nest until they are less than half grown at which time they begin to be covered with a dense white down which provides excellent insulation. They are soon able to move and seek shady spots under the willows and cottonwoods during the hotter period of the day. The young dissipate body heat by fluttering their elastic throat pouches at a very rapid rate. During the cool mornings and evenings the younger birds are seen to huddle together to keep warm. The new birds of the year learn to catch fish when they are about two-thirds grown.

Because the white pelican has chosen Colorado for its new home and has succeeded in producing and rearing young, it then stands that this bird must be considered a valuable part of the state's ecosystem. Coloradans should take pride in the state's ability to attract and support a diversity of wildlife species. Your strong support is needed to insure a place for the white pelican in Colorado.

Outdoor Highlights

By GEORGE FELTNER



Fishing Regulations Available

The 1975 fishing regulations in booklet form are now available from the Division's 1,000 license agents, or from any Division office. A total of 770,000 have been printed.

The new regulations feature a change in format designed to make regulations for specific waters easier for the fisherman to find within the booklet. The regulations actually contain all of the fishing, hunting and land use regulations pertaining to all properties under Division control. Previously it was necessary to consult several listings in several sections in several publications in order to find out what restrictions, if any, prevailed.

A Perfect Book

The perfect book has been published by the Honolulu Zoo. The 20-page volume, *Snakes of Hawaii*, is said to be "completely devoid of zoological, grammatical, and typographical errors." Small wonder! All the pages are completely blank. There are no snakes in Hawaii.

Library Gets Book Catalog

A new time-saving research index for patron use recently has been added to the Conservation Library of the Denver Public Library (DPL), according to city librarian Henry G. Shearouse, Jr.

The G. K. Hall publishing house has completed a book catalog of the Conservation Library holdings, with expense of printing borne by the publishers, and a percentage of the royalties paid to DPL.

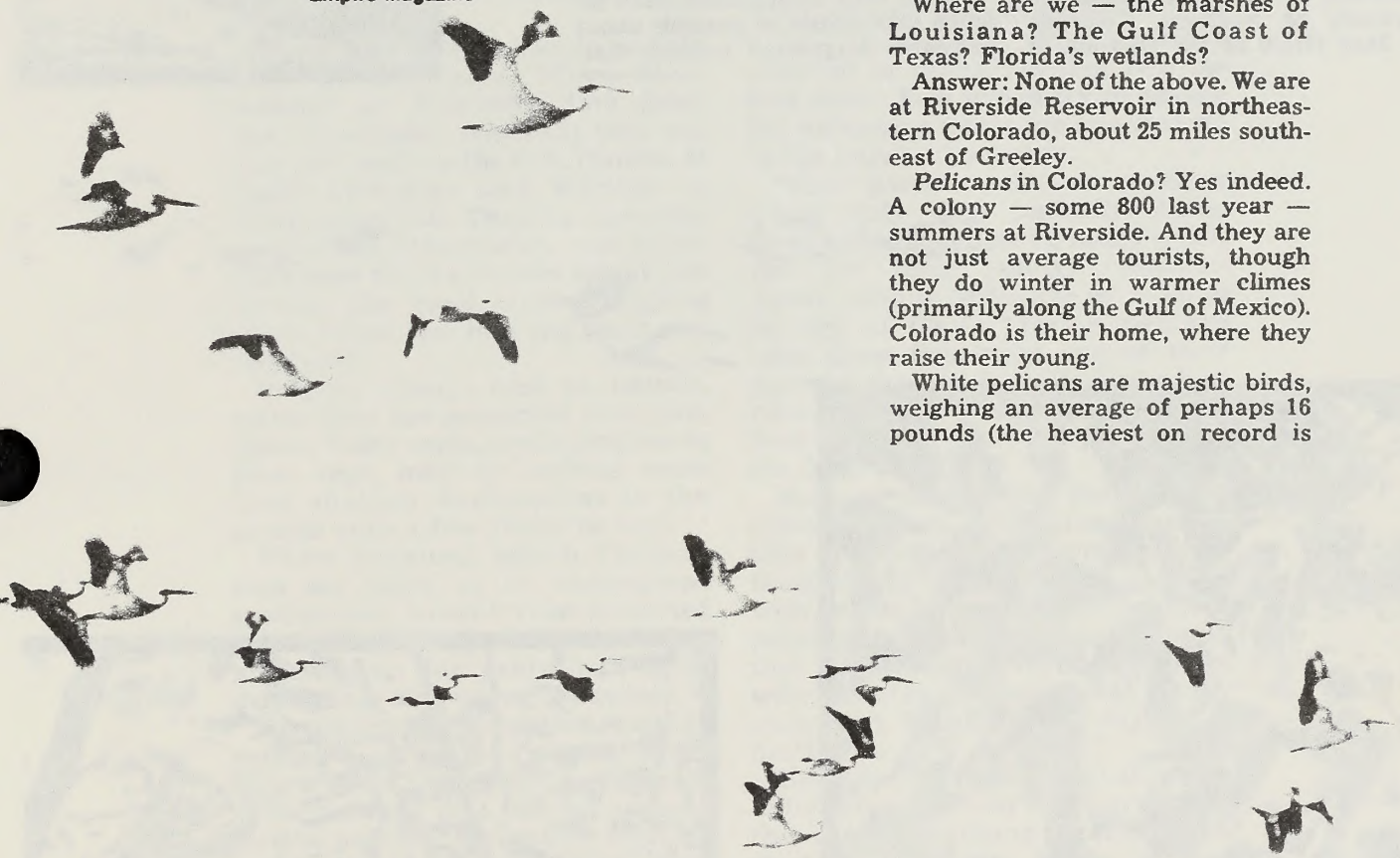
The catalog, which is printed in six volumes, provides patrons and librarians with listings of Conservation Library materials not included in the general card catalog. According to Shearouse, the catalog will be updated regularly.

The six-volume set is available for use

Photography by George Crouter

Yes, pelicans in Colorado

By BARTELL NYBERG
Empire Magazine



MAGNIFICENT sparkling-white pelicans, those giant birds with coal-black wing tips and orange-gold beaks and pouches, glide over a willow-greened island and ease onto the calm, blue water.

Swimming silently, the birds search for fish, not only for themselves but also for their hungry, flightless offspring waiting not so patiently on that nearby island.

'Tis a privilege to drink in the elegance of the white pelican, the snowy egret, the black-crowned night heron, the California gull, the double-crested cormorant.

Where are we — the marshes of Louisiana? The Gulf Coast of Texas? Florida's wetlands?

Answer: None of the above. We are at Riverside Reservoir in northeastern Colorado, about 25 miles southeast of Greeley.

Pelicans in Colorado? Yes indeed. A colony — some 800 last year — summers at Riverside. And they are not just average tourists, though they do winter in warmer climes (primarily along the Gulf of Mexico). Colorado is their home, where they raise their young.

White pelicans are majestic birds, weighing an average of perhaps 16 pounds (the heaviest on record is

about 30 pounds) with a wingspan of 8 to 10 feet. The world's largest web-footed birds, they, nevertheless, are strong, graceful flyers — at least after a lumbering start to gain altitude.

Riverside's pelican colony was sighted in 1961 by a gun-club caretaker. Wildlife officers Norman Hughes and William Rutherford first saw the pelicans on May 29, 1962, while taking an aerial bird count. Two months later a team including Dr. Ronald Ryder of Colorado State University, Dr. Bert Thomas of the University of Northern Colorado and Jack Grieb of the Division of Wildlife returned, banding 45 of the young. Since then, wildlife officers and college personnel have banded 1,515 more young pelicans.

Last year a team of eight banded 300 pelicans, the most ever. The total pelican population, about 800, was up 150 over the previous year, says John Torres, nongame supervisor in the Division of Wildlife.

Why do wildlife conservation officers and university professors clip tiny aluminum bands to the legs of 6- to 10-week-old pelicans?

These bird enthusiasts seek as much information as possible about pelicans' migration habits, diet, →

Pelicans are master fishermen

PELICANS *continued*

nesting patterns, life expectancy and causes of death.

These numbered bands supply some of that data. When bird-watchers or fishermen find dead, banded pelicans, hopefully they will mail the bands to the U.S. Bureau of Sport Fisheries and Wildlife in Washington, D.C. There a computer records the information and prints out a card for the bander (identified through the band number) telling when, where and how the band was recovered.

Pelicans always nest on islands, where they are protected from predators. Their nests, containing one to three eggs, may be nothing more than shallow depressions in the ground with a few sticks on top.

White pelicans, which Thomas says are listed as an endangered species now, weren't even protected birds until 1971. Even some wildlife professionals for years had considered them fish-eating nuisances.

Riverside, an irrigation storage reservoir, boasts a large carp population; these fish comprise the bulk of the pelicans' diet. It is not unusual for the pelicans to venture to other northeastern Colorado lakes and reservoirs, too, in search of fish — or perhaps a day's outing.

Pelicans in the large colony (more than 5,000 adults) on Gunnison Island in Utah's Great Salt Lake often fly 80 to 100 miles per day in search of fish in fresh-water marshes.

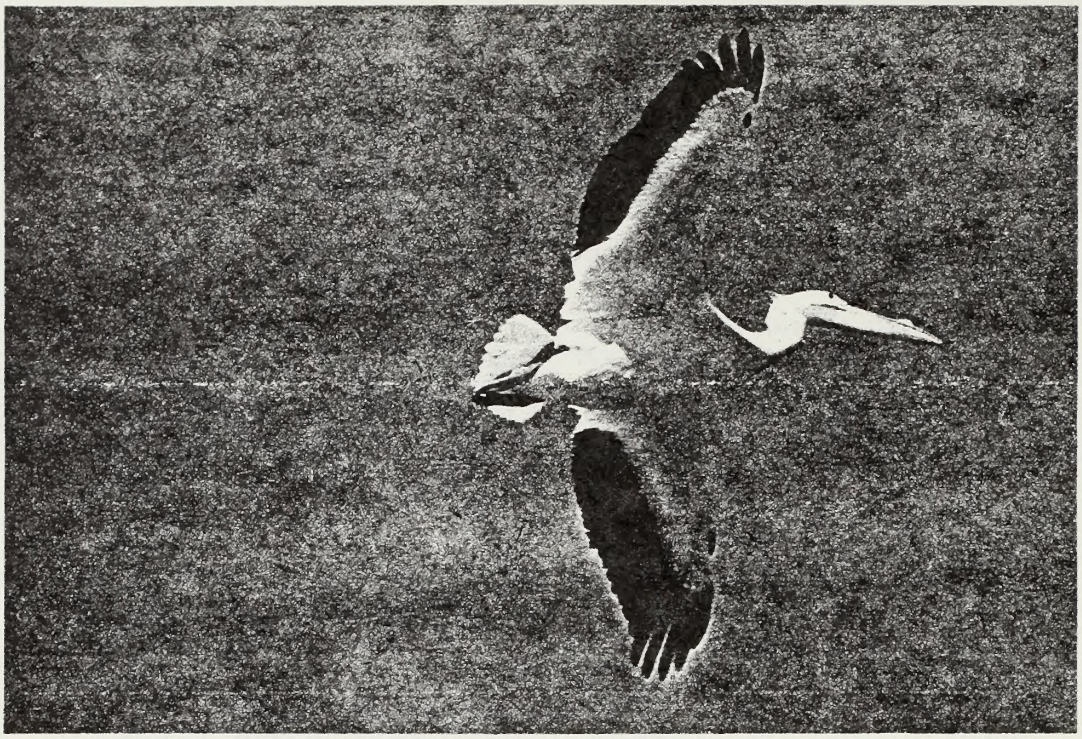
Pelicans, master fishermen, sometimes join forces to catch their fill. First, several swimming birds form a line, then slowly close it into a crescent or circle, herding fish before them. Fish which try to escape the tightening noose are scooped up in the pelicans' pouches.

"The parent pelicans swallow whole fish, then partially digest them and regurgitate virtually whole fish for their young," explains Ryder, who is professor of wildlife biology at CSU. "Young pelicans take these fish right out of their parents' throats. It really looks horrible to see the young birds chasing their parents around and picking out the fish."

Because of their fish diet in agricultural waters, pelicans are susceptible to pesticide accumulations in their bodies. Researchers working with other birds, including brown pelicans in California, have found that DDT residues resulted in eggs with abnormally thin shells. Many such eggs break during laying or nesting.

However, UNC's Thomas says that in five years of study he hasn't found thin egg shells among the white pelicans at Riverside. While he has found a decided mortality rate among eggs of the Colorado pelicans, he doesn't have sufficient data to determine whether the problem — not thin shells — is related to pesticides.

"The biggest problem at Riverside is habitat, not pesticides," he says. →



A pelican in flight is an awe-inspiring sight—beautiful and graceful.

PELICANS *continued*

The Division of Wildlife and UNC students and faculty have rebuilt the pelican island, which had been eroded by water. The island now measures about 100 yards long and 50 yards wide, only an acre out of the 3,800 acres the reservoir encompasses when full.

Torres hopes this year the Division of Wildlife will rebuild the original nesting island (which the pelicans abandoned when it became badly eroded several years ago) to provide more space for the colony.

Last July wildlife officers placed 14 fledgling pelicans at Lower Latham Reservoir just southeast of Greeley, where they also built an island after the dam broke, draining the reservoir, in April 1973. Hopefully, Torres says, some of these young birds imprinted there and will return to Latham with nesting adults this year and establish a colony.

"We need to take some of the nesting pressure off Riverside," Torres explains.

Colorado's pelican colony heads south by November each year. They will return in March or April.

Another small colony of white pelicans nests in Yellowstone Lake, inside Yellowstone National Park in Wyoming. There, the birds often feed on trout, a practice some fishermen don't appreciate. The biggest colony in this portion of the country nests at Chase Lake in North Dakota.

For several years Colorado birdwatchers boasted that Riverside harbored the country's southernmost nesting colony of white pelicans. Now, however, they have learned that several colonies nest in Texas, some near the Gulf Coast and at least one colony inland in fresh water. ■

Research Proposal and Progress Report

for

RESOURCE PARTITIONING BETWEEN HUMANS AND A COLONIAL WATERBIRD COMMUNITY

Submitted To: U.S. Department of Interior, Bureau of Land Management

Submitted By: Gary C. Miller, M.S. candidate, Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins 80523

Location: Pelican Island, Riverside Reservoir, 3.2 km N. of Masters, Weld County, Colorado.

Period: 1 April 1976 - 1 April 1978 (2 field seasons).

Funding:

Contributed by Colorado State University:	$7226
Contributed by Colorado Division of Wildlife:	$1500
Previous National Audubon Society Grant:	$1000
Requested from Grantor:	$2035

Other potential Grantors: National Audubon Society, Welder Wildlife Foundation, National Wildlife Federation

Colorado Division of Wildlife

Date Prepared: 15 November 1976

1. Problem Statement: What habitat management procedures will maintain desired population levels and species diversity of colonial waterbirds nesting on insecure islands in the midst of high human demands?

2. Justification: Wildlife management has been defined as "the process by which closely related needs of wild animals and of people are evaluated, reconciled, and met" (Scheffer 1974). The only breeding colony of white pelicans (Pelecanus erythrorhynchos) in Colorado have successfully nested for 14 years in an area surrounded by intensive human recreational and agricultural pursuits. These birds, plus colonies of double-crested cormorants (Phalacrocorax auritus), California gulls (Larus californicus), great blue herons (Ardea herodias), black-crowned night herons (Nycticorax nycticorax), and snowy egrets (Egretta thula), have been sharing Pelican Island, located on Riverside Reservoir in northeastern Colorado, since 1968.

Nearly as diverse as the waterbirds are the owners and administrators of the physical resources that determine the fate of the waterbird colonies. The Bureau of Land Management (BLM) administers Pelican Island, and the other two islands on the reservoir, in addition to much of the reservoir's shoreline. The Riverside Reservoir Company and its lessee, Riverside Club Company (a gun club), control the use of water in the reservoir, and many ranchers and farmers control the primary foraging areas used by the Pelican Island birds. The Colorado Division of Wildlife (DOW) and the BLM have entered into a cooperative agreement to provide for optimum human uses of BLM lands compatible with the waterbirds' needs. Cooperation among all parties to protect the colonies has so far been effective, but increased demands upon the region, especially for water-based recreation and irrigation, could threaten this situation. There is an immediate need for precise knowledge of the needs of the waterbirds and of the positive and negative effects of human activities upon these birds. This knowledge would have

specific application to the Pelican Island colonies and general application in similar situations.

Pelican Island is man-caused habitat, created by accident with the construction of Riverside Reservoir in 1898. The island has since changed in shape and location, and grown ever smaller, from wind and wave erosion of the sandy soil. To induce more colonial bird nesting, the DOW has built an island on nearby Lower Latham Reservoir and plans to construct another on Meredith Lake in southeastern Colorado. Plans are underway by the Colorado Division of Parks and Outdoor Recreation to construct a white pelican nesting island on Barr Lake, near Denver, as part of an effort to stress non-consumptive uses of wildlife. It is not yet known how islands should be designed and/or maintained to optimize use by desired species, but one purpose of the investigation is to gain this knowledge and disseminate it to interested parties.

The dominant, but perhaps least understood, species on Pelican Island is the white pelican. This species requires islands for nesting but, in the western United States, there is rarely the assurance that one year's island will not become either inundated or landlocked the next. The response of white pelican populations to such insecure nesting conditions, and the response of colonies to scarce nesting resources,will be better understood with verification of the species' breeding age and a model of the colonies' age and social structure. This study is designed to fulfill both of these needs.

The white pelicans cannot be considered alone, however, since six species share the same nesting island. Although gross partitioning between tree and ground nesting species is evident, nest site partitioning among these divisions is not clear. Management decisions concerning this and similar habitats should be made with understanding of this partitioning and the ecological effects of one colony upon the others.

Foraging areas used by the waterbirds, including the reservoir, are productive but ephemeral. Most are dry by mid-August. Food resource partitioning strategies may be quite different for this apparently temporally patchy environment than has been suggested for areas that are spatially patchy (MacArthur and Pianka 1966). This possibility would have profound effects upon our knowledge of colonial waterbird ecology and habitat management.

The Pelican Island birds have shown a remarkable ability to successfully nest in an area not protected by refuge designation or by physical barriers, but an area protected largely by voluntary "gentlemen's agreements." If the factors contributing to this success are identified, it seems likely that colonial waterbird habitat might be created or improved on the half-million acres of national resource land (NRL) wetlands and those wetlands controlled by other parties. Perhaps the white pelican can then be removed from Colorado's threatened species list, and allowed to expand its present population levels and distribution throughout the western United States. Perhaps, then, the diversity and quality of both human and wildlife habitat will be enhanced.

3. Objectives and Methods:

a. Identify the mechanisms of nesting resource partitioning.

1. Obtain site characteristics of selected nests including: (1) associated vegetation and foliage density, (2) main support diameter and distance from main stem, ground, and tree top (tree nests), (3) nest dimensions, (4) nesting material description and measurements, (5) adjacent nest type and distance.
2. Record the fate of selected nests and test the hypothesis of a relationship between site characteristics and nest productivity.
3. For the white pelican:
    a. Verify the breeding age and model population responses to habitat losses.
    b. Investigate the social structure and age composition of white pelican colonies by recording case histories of selected individuals.

b. Identify the mechanisms of food resource partitioning.

1. Record the physical and biological characteristics of foraging areas.

2. Observe foraging and record: (1) time spent foraging, (2) time spent in pursuit, capture, and eating, (3) number, species, and estimated size of prey captured.

c. Determine how human activities, including land and wildlife management, might best be employed to maintain waterbird populations and species diversity in the face of potentially conflicting human and waterbird demands.

1. Record effects of humans and waterbirds upon each other.

2. Induction from all preceding observations.

4. Study Procedures:

a. Review literature.

b. Formulate hypotheses, define sampling and experimental units.

c. Select methods of data collection and analysis.

d. Collect field data.

e. Test hypotheses, analyze data.

f. Write reports.

5. Schedule:

Years and Months		Procedures
1976	April - October	a,b,c,d
1976/1977	November - February	a,d,e,f
1977	March - October	a,d
1977/1978	November - April	e,f

. Status: The Riverside waterbirds have received much regional publicity but limited research and management since white pelicans were first seen there in 1962 (Ryder

and Grieb 1963). The white pelican was declared an endangered Colorado species in 1973, and was pictured on the 1975 DOW Conservation stamp. Funds from the sale of the stamp contributed to the construction of an erosion abatement breakwater on Pelican Island in 1976. The status of the white pelican was changed to threatened in Colorado in 1975.

Data on migration and winter distribution of the Riverside waterbirds has been collected since 1962 by Dr. R. A. Ryder and the DOW (Ryder and Torres 1974). They have banded 1748 young white pelicans, and over 1200 of the other species on the island. In 1975, the DOW banded 40 young white pelicans as part of an investigation to document distribution and daily movements of the birds (Bouffard and Graul 1975). Graul and Ryder (1975) reported on white pelican status in Colorado, noting research and management needs. In 1974, a long-term study of pesticides in the Riverside white pelicans was completed, and no evidence of pesticide-caused mortalities was found.

7. 1976 Progress: Between 15 April and 2 September 1976, I spent 533 hours in direct observation of the birds of Pelican Island, facilitated by living next to the reservoir. During the nesting and incubation periods, I watched activities upon the island from shore and from a camouflaged canoe, using a 15-60 X spotting telescope. On 6 July, after most incubation upon the island had ceased, I began observations from an elevated blind at the edge of the largest white pelican colony. From this point, I could see approximately 70 percent of the island, including all tree nests. Disturbance of the colonies was minimized by going to the blind before sunrise and not leaving until after sunset. Young white pelicans commonly rested and were fed in the shade beneath the floor of the blind indicative, perhaps, of the minimal effect of my activities upon the birds.

1976 Nesting Data: The information contained in Table 1 has been transmitted to the Colonial Bird Register, Cornell Laboratory of Ornithology, Ithaca, New York.

Table 1. Summary of the 1976 nesting season at Pelican Island, Riverside Reservoir, Weld, County, Colorado.

Species	Nest attempts	Young hatched	Young fledged	Mean fledging success/nest
White pelican	270	356	316	1.17
California gull	50	5	2	0.04
Double-crested cormorant	12	≥44	32	2.67
Great blue heron	10	≥29	19	1.90
Black-crowned night heron	8	27	19	2.38
Snowy egret	3	13	10	3.33

Nesting Island Data - Ground Nests: Early spring was the time of highest demand and lowest availability of ground nesting sites for white pelicans and California gulls. Riverside Reservoir was at capacity and Pelican Island, measuring about 2.6 ha, had approximately 1.7 ha of suitable ground nesting area. The island grew larger with the reservoir drawdown that began on 14 June, but no nests were established on newly exposed areas. When Pelican Island was deserted on 2 September, 15 white pelican nests were found in suitable condition to record site characteristics. No California gull nests were recognizable.

White Pelican: The first young white pelicans hatched on or about 22 May, and the peak of hatch occurred during the second week of June. On 14 July, 100 young were banded with standard aluminum leg bands and blue plastic leg bands by personnel of the DOW, Dr. R. A. Ryder, and myself. A Lincoln index applied to count data (banded

and total young counted) subsequently verified the direct census of young production. At least two young, aged three to four weeks, died by choking on large carp, a white pelican mortality factor I have not discovered in the literature, although Ryder (1950) noted it for great blue herons.

In order to recognize individual white pelicans, leg band numbers were read with a spotting telescope by Dr. Ryder, H. J. Griese, and myself. I began constructing case histories of 19 adults and 30 young, including 8 family groups. Most nesting adults identified were between three and six years old, roughly consistent with the findings of Diem and Condon (1967). Some two year olds were present on the island, although their nesting and/or feeding of young was not verified. The activities of two year old white pelicans rarely have been documented.

California Gull: At least some of the California gull nesting sites were usurped by late nesting white pelicans, and a severe hailstorm on 28 May may have adversely affected the nesting attempt. No more than five young gulls hatched, one nestling was apparently killed by a juvenile great blue heron, and only two survived to fledging on 8 August (Table 1).

Nesting Island Data - Tree Nests: Five large plains cottonwoods (Populus sargentii) contained all great blue heron and double-crested cormorant nests in 1976. An erosion abatement breakwater may slow the wind and wave erosion that threatened to undercut and topple some of these trees. A vigorous stand of younger cottonwoods, used by black-crowned night herons in 1976, may provide suitable large tree nesting sites in the future.

A dense stand of willows (Salix sp.)contained all the snowy egret nests and 25 percent of the black-crowned night heron nests. Willow growth appeared vigorous in spite of browsing by cattle that annually cross to the island on a land bridge exposed by reservoir drawdown.

Double-crested Cormorant: Most young had fledged before I began observations from the blind. In addition to gathering nest production data (Table 1), I was able to follow the fates of two nests, Better use of a camouflaged canoe should correct this deficiency in 1977.

Great Blue Heron: Great blue heron nest sites were located lower and in more open areas than the double-crested cormorant sites. The four smallest nesting platforms were generally associated with late nesting and, except in the case of nest GBHDS4, high mortality. Three young hatched from nest GBHDS4 and, at age four weeks, moved to a platform (GBHDS1) that had been abandoned by fledged great blue herons. All three survived to fledging. Another nest (GBHRT2) fell during the nestling stage, but three of the four young survived to fledging on a platform tilted at 45 degrees from the horizontal.

Black-crowned Night Heron: Nest site characteristics of black-crowned night herons were more diverse than those of any other tree nesting species. The two nests located in the most open sites, near great blue heron nests, fledged one young each, while the two nests in dense willows, near snowy egret nests, fledged three young each. Nests in the young cottonwood stand, which were intermediate in foliage density and distance to main stem, fledged a mean of 2.7 young per nest.

Snowy Egret: The three pairs of snowy egrets nested low (mean nest support height 1.6 m) in a dense willow stand. Early in development, the young were fed three times daily. Later, as the young were about to fledge, feeding by adults became sporadic, and the young snowy egrets stalked the island and preyed upon dipteran and orthopteran insects.

Foraging Area Data: Of the 32 identified areas, 53 percent were less than 1.3 ha

maximum area, less than 1.2 m maximum depth, lentic, and inhabited primarily by carp (Cyprinus carpio), crayfish (Procambarus sp.), and tiger salamanders (Ambystoma tigrinum). A maximum of 7 areas were used exclusively (temporally and spatially) by one species. Foraging area overlap was greatest between great blue and black-crowned night herons, which shared 74 percent of their foraging areas. White pelicans and double-crested cormorants had 50 percent of their foraging areas in common. Initial indications were that the primary method of food resource partitioning was by selection of prey with respect to species and size, not by partitioning of the foraging patches.

8. 1977 Activities: Important new information about the population dynamics and social structure of white pelican colonies may result from the continued construction of individual and family case histories in 1977. One hundred young will again be color banded and the fate of young recorded. Hypotheses to be tested include: (1) white pelicans breed at an age of two years, (2) white pelican colonies are comprised of small aggregations of nesting pairs that share, to some degree, the care of young.

The apparent competition for ground nesting sites between California gulls and white pelicans will be fully investigated. Although the role of the California gull as an egg predator is well documented (Behle 1958, Knopf 1975), the white pelican - California gull relationship may well be mutualism at the community level.

Because of small sample sizes, it may be unrealistic to rely totally on statistical analysis of tree nest site characteristics to yield accurate information about nest site partitioning. I will continue to collect information about these characteristics and follow the fate of selected nests. In addition, I may decide to experimentally test nesting material preferences among the four tree nesting species.

Observations of the primary foraging areas will continue as in 1976. In addition, will collect and analyze regurgitated stomach contents of the birds.

9. Estimated Expenditures, 1 April 1976 - 1 April 1978

Item	Total Expenditure	Provided by CSU	Provided by DOW	Previous NAS Grant	Requested from Grantor
Living Expenses ($400/month)	$9600.00	$5900.00[1]	$1000.00	$200.00	$1000.00
Field Quarters ($100/month) May - September	1000.00			500.00	500.00
Tuition ($238/semester)	952.00	476.00			
Fees ($90.25/semester)	361.00			180.50	
Automobile Travel (7500 mi. @ (7500 mi. @ $.15/mi.)	1125.00		500.00		300.00
Horse Rental	200.00				200.00
Blind Construction	50.00	50.00			
Expendable Materiel & Supplies					
1. Paperware, maps, collecting licenses	100.00			50.00	
2. Film (movie & still) recording tape	55.00			25.00	
Non - Expendable Equipment					
1. Binoculars, spotting telescope, tape recorder	300.00	300.00			
2. Movie camera & accessories	400.00	400.00			
3. Limnological sampling supplies	100.00	100.00			
4. Electric canoe motor, battery	135.00				

(continued)

Item	Total Expenditure	Provided by CSU	Provided by DOW	Previous NAS Grant	Requested from Grantor
Services					
1. Long distance telephone	$30.00			$15.00	$15.00
2. Film processing & photo lab	50.00			29.50	20.00
3. Typing & drafting	50.00				
4. Literature search	20.00				
5. Duplicating	15.00				
TOTALS	$14543.00	$7226.00	$1500.00	$1000.00	$2035.00

Graduate Research Assistant: Gary C. Miller[1]

Project Supervisor: Dr. Ronald A. Ryder

DOW Supervisor: Dr. Walter D. Graul, Nongame Bird Specialist

[1] funded 2 semesters each year as Graduate Teaching Assistant

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RIVERSIDE RESERVOIR, COLORADO: 1976 NESTING SEASON REPORT

Riverside Reservoir, located in northeastern Colorado (latitude 40°20', longitude 104°10') at an elevation of 1472 meters (4500 ft.) is a privately owned irrigation reservoir. During the nesting season, it is characterized by approximately 15 km^2 of open water surrounded by sand, sagebrush, and short grasses, and a 2.5 hectare island vegetated with willow(Salix sp.) and plains cottonwood (Populus sargentii). About 98% of the fish in the reservoir are carp (Cyprinus carpio) and suckers (Catostomus sp.). Twenty-eight ephemeral seepage ponds, located behind the reservoir dike, are vegetated with cattails (Typha sp.), bulrush (Scirpus sp.), pondweed (Potamogeton sp.), and crowfoot (Ranunculus sp.), and contain salamanders, turtles, crayfish, and, in some cases, suckers and carp. A summary of the nesting season activities of the more prominent birds of the Riverside Reservoir system follows.

Western Grebe: Approximately 15 non-breeders spent the summer on the reservoir.

California Gull: Approximately 50 pairs attempted to nest on the island. The sites initially selected were usurped by late nesting white pelicans. A severe hailstorm o 28 May, with hailstones averaging 105 millimeters in diameter, may have had an advers effect upon nesting. We detected only 5 young hatched, and only 2 young California Gulls survived to fledging on 8 August.

Franklin's Gull: This species did not nest at Riverside Reservoir, but 25 arrived o 23 June, and their numbers steadily increased. In mid-July, at the peak of grasshop abundance, about 600 were regularly seen around the edge of the reservoir.

Double-crested Cormorant: Approximately 12 pairs nested in 3 cottonwood trees on th island. As of 31 July, 30 young had fledged, 3 were in the nestling stage, and the count of young mortality had reached 8.

White Pelican: ~~On 12 May, there were~~ About [illegible] nests on the island (aerial photograph estimate). ^ The first young hatched on or about 22 May. The peak of hatch occurred during the second week of June. Approximately 327 young were alive on 31 July (estimate from direct census and Lincoln index data). Although the timing of the hatch is comparable to Knopf's (1975) findings for the Gunnison Island, Utah white pelican colonies, the nest production average of 1.[illegible] young/nest is ~~somewhat lower~~.

Note: The white pelicans are also treated in Walt Graul's report. Our original estimates of young, contained in his report, have since been revised upward.

American Bittern: Only 1 nest of this species was discovered this season, although 4 adults were in the area. The nest, located in a cattail-choked ditch, contained 5 eggs on 5 June. By 10 June, the nest had been destroyed, apparently by a mammalian predator.

Great Blue Heron: By 31 July, 17 young had fledged from 8 nests, 2 additional nests contained 3 nestlings each, and at least 4 young had died. All of the nests were located in cottonwood trees on the island.

Snowy Egret: Three pairs nested in small willows on the island. By 31 July, 7 young were fledged from 2 nests, and the third nest contained 3 nestlings.

Black-crowned Night Heron: Approximately 8 pairs nested on the island. A minimum of 20 young were alive on 21 July. The most successful nests, averaging 3.0 fledged young/nest, were those in the same trees as the Snowy Egrets. The 2 nests that occurred in the same trees as the Great Blue Herons fledged only 1 young each.

American Coot: The only known nesting of this species took place in one of the seepage ponds. Four young were seen on 18 July, and only 3 young were alive on 2 August. Predators seen near this pond were striped skunk, raccoon, and longtail wea which may have had some influence on the low production.

Wilson's Phalarope: Between 20 and 30 adults spen he summer on small ponds in the sand and sagebrush areas by the reservoir. Only 2 young were observed. California Gull use of this area was high throughout the summer, and could have adversely affected production.

American Avocet: Between 10 and 20 adults were present on the same ponds as the Wilson's Phalaropes. Nesting was attempted and 3 young were seen. One nest suffered avian predation, probably from California Gulls, since no corvids were ever seen in that area.

Summer Visitors: On 24 June, the following species were seen on newly exposed mudflats caused by draw down of the reservoir: White-rumped Sandpiper (1), Marbled Godwit (3), and Willet (6). None of the above species were seen following that day until 2 August, when 10 Marbled Godwits were seen. Also worthy of note are 2 Long-billed Curlews that visited the reservoir on 18 June.

Other species that nested at Riverside Reservoir, but for which no estimates of production were made are: Mallard, Gadwall, Blue-winged Teal, Pintail, Redhead, Canada Goose, Killdeer, Yellow-headed Blackbird, and Red-winged Blackbird. Between 15 and 30 pairs of Red-winged Blackbirds nested on the island, but no estimat of young production was attempted.

Submitted: 9 August 1976

MANAGEMENT RECOMMENDATIONS FOR THE COLONIAL WATERBIRDS

of

PELICAN ISLAND, COLORADO

A Preliminary Report

by

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The white pelican fledging success of 1.17 per nest in 1976 was much higher than any recorded in the literature. The success of the other species on Pelican Island, except the California Gull, was at the upper range of normal success. Being of the general belief that wildlife succeeds as much in spite of our efforts as because of them, I make the following recommendations, based on my 1976 field observations, with due caution.

Grazing: Grazing at 1976 levels appears compatible with the waterbird colonies. The cattle cross to the island for shade and some foraging late in the summer, after most birds have left. Cattle activity seems to counteract the rank willow growth that could decrease suitable ground nesting habitat. Enough willows were left this year to act as a drift fence for windblown sand. Grazing at 1976 levels with no restriction of cattle access to the island after drawdown (if drawdown occurs late in the season) seems desirable.

Fishing: The reservoir contained many large carp during 1976. The habits of these fish make them an excellent prey base for the white pelicans and double-crested cormorants. Most white pelican foraging during the metabolically expensive incubation period occurred on Riverside Reservoir, and this may have contributed to the success of the birds. Carp fishing pressure was light, and exhibited no detrimental effects upon the waterbirds. The effects of the waterbirds upon the fishermen was, in all cases noted, positive. The fishermen expressed enjoyment of the birds. Introduction of "game" fish, such as walleye and northern pike, should not be permitted, since they are not so well suited to the waterbirds' needs, create demands for fishing from vessels, and would deprive one segment of the recreating public (carp fishermen) of a pleasant, productive fishing spot.

Boating: The critical factor in waterbird-motorboat "equations" is the variable operating the vessel. White pelicans foraging on Empire Reservoir in 1976 were frequently harassed by boaters. On Jackson Reservoir, the birds generally restricted their activities to the large shallow areas in which boats did not normally operate. In general, on Jackson Reservoir, greater numbers of white pelicans were observed when few boats were present. The Riverside Reservoir Company and the Riverside Club Company do not allow boating on Riverside Reservoir at present, but there is no assurance that this will always be so. The DOW and BLM should develop a course of action that could be employed to restrict motorboating on Riverside should the need arise.

Hunting: In 1976, the white pelicans and some California gulls and double-crested cormorants were still at the reservoir during the early portions of waterfowl hunting season. I did not discover any evidence of hunter harassment or shooting of the birds and make no recommendations concerning hunting at this time.

Aircraft: Throughout the summer, aircraft frequently passed near the island. All birds reacted adversely to any aircraft passing nearer than about 1 km (ground distance) to the island. If the plane was closer than about 250 m to the island, birds flew from the island. At distances between 250 and 1000 m, the birds sometimes flew and sometimes walked from the island. In either case, incubating birds left their nests, and young birds were often exposed to the hot sun. The reservoir dike tended to muffle aircraft noise, and the birds showed no response to planes flying along the far edge of the dike. Enforcement of DOW regulations concerning flights over the island may be difficult, so cooperation of pilots should be sought. Crop dusting contractors, flying clubs, and airports in the Greeley - Fort Morgan area should be contacted concerning this subject, and asked to keep aircraft flights no closer to the island than the outside edge of the reservoir dike.

Birdwatching: This activity is compatible with the waterbirds' needs at any time and place along the reservoir dike.

Changes to the island: The breakwater erected along the north shore of the island blocks one of the white pelicans' ingress/egress "ramps" between the north nesting site and water. There are alternate ramps the birds may use at each end of the breakwater. The slope leading from the west end has some willow growth that should be thinned before the 1977 courtship period to facilitate travel of courting flocks. The white pelican activity would probably maintain the open ramp thereafter.

Research and monitoring: Research of the waterbirds and their habitat should continue, especially because of the changes made to the island in 1976, until a clear understanding of the birds' requirements and tolerances is gained. Monitoring of nesting, productivity, and mortality should be performed annually.

To:
rom: Gary C. Miller Department of Fishery and Wildlife Biology, Colorado State Univ
ubject: Revision of Riverside Reservoir, Colorado: 1976 Nesting Season Report.
23 August 1976

Followingisa corrected version of the White Pelican section of the report.

White Pelican: On 17 May 1976, there were about 240 nests on the island (aerial photograph estimate) and approximately 30 nests were begun after that date. The first young hatched on or about 22 May. The peak of hatch occurred during the second week of June. Approximately 327 young were alive on 31 July (estimate from census and Lincoln index data), yielding a nest production mean of 1.21 young per nest. This number will decrease with additional chick mortality during August and September. The timing of the nesting cycle of Riverside white pelicans was about 1 week later than determined for the Gunnisson Island, Utah white pelicans by F. L. Knopf (1975), but the final mean nest production figure may be higher.

Note: The white pelicans are also treated in Walt Graul's report. Out original estimates young, contained in his report, have since been revised upward.

Literature Cited

Knopf, F. L. 1975. Spatial and temporal aspects of colonial nesting of the white pelican Pelecanus erythrorhynchos. Ph. D. Dissertation. Utah State University, Logan. 64pp.

Appendix No. 3

Sikes Act Supplement to the

Master Memorandum of Understanding

BLM-DOW

DEPT OF INTERIOR
BUR LAND MANAGEMENT
COLO STATE OFFICE DEN
75 APR 16 AM 10:00

Supplement to the
MASTER MEMORANDUM OF UNDERSTANDING
between
THE COLORADO DIVISION OF WILDLIFE
AND
THE BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR, COLORADO

SIKES ACT IMPLEMENTATION

This supplemental memorandum of understanding is pursuant to the Memorandum of Understanding between the Colorado Division of Wildlife (DOW) and the Bureau of Land Management (BLM), Colorado, dated April 9 1975.

The Sikes Act of October 18, 1974, Public Law 93-452, provided broad authority to: 1) Plan and carry out wildlife conservation and habitat rehabilitation programs on National Resource Lands (NRL) consistent with overall land use plans; 2) Protect significant habitat for Threatened and Endangered Species; and 3) Enforce regulations to control Off Road Vehicle traffic (ORV) or other public use of lands subject to conservation and rehabilitation programs conducted under the Act.

The Act in no way diminishes the authority of the State of Colorado to manage wildlife.

It is the purpose and intent of this supplement to provide a working relationship and procedure for implementation of the Sikes Act on NRL in Colorado between the Colorado Division of Wildlife and the BLM, Colorado.

Definitions used in this supplement are defined as follows:

1) Conservation and rehabilitation program - Includes programs necessary to protect, conserve, and enhance wildlife resources to the maximum extent practicable on NRL consistent with any overall land-use and management plans (Management Framework Plan, see below) for the lands involved.

2) Management Framework Plan (MFP) - BLM's approved, multiple-use management plan for NRL in a specific administrative area. The MFP is a dynamic plan for NRL action resource management and is based on public input.

3) Habitat Management Plan (HMP) - BLM's intensive, detailed action plan for wildlife management on a specific, geographic biological area of NRL. The HMP is a cooperative plan with the State Wildlife agency and is based on an approved MFP. The HMP shall be the implementing document for the Sikes Act.

THEREFORE, BE IT RESOLVED THAT FOR THE PURPOSE OF ENACTING P.L. 93-452, the DOW and the BLM, Colorado, mutually agree to the following:

1) HMPs will be implemented only on areas where MFPs have been prepared, unless otherwise authorized by the Director, BLM, Colorado.

2) HMPs will be based on priorities within Colorado, as mutually selected by the Director, DOW, and the Director, BLM, Colorado. Criteria for establishing HMP priorities shall be based on the following:

a) Resource values to be enhanced and benefits produced.

b) Areas where the need for intensive wildlife management has been identified, through the BLM or DOW planning systems.

c) On or near areas where wildlife habitat is subjected to significant land use changes, particularly energy development, industrial uses, urban expansion and ORV use.

d) The existence of significant wildlife habitat, such as a deer winter range, or habitats of Endangered or Threatened Species.

3) Protection will be afforded to those fish and wildlife species designated as Threatened or Endangered by the Colorado Wildlife Commission or by the Secretary of the Interior pursuant to Section 4 of the Endangered Species Act of 1973.

4) HMPs will specify fish and wildlife habitat improvements or modifications needed.

5) Rehabilitation of NRLs will be undertaken where necessary to support HMP recommendations.

6) Hunting, fishing and trapping on HMP areas will be in accordance with applicable laws and regulations of Colorado.

7) It is herein recognized that the Secretary of the Interior has the authority to promulgate regulations to control the public use of NRL consistent with the HMP, including, but not limited to ORV use.

8) Funds authorized and appropriated for HMP implementation on NRL in Colorado shall include, but not be limited to all activities associated with scientific resource management, such as the following: protection, research, census, law enforcement, habitat management, propagation, live trapping, transplantation, and regulated taking. Funds may be allocated for hiring of personnel, grants to colleges, contractual services, and physical habitat improvement projects. It shall be the joint responsibility of the Director, DOW, and the Director, BLM, Colorado, to define areas and projects for priority Sikes Act funding. It shall be the responsibility of the Director, BLM, Colorado, to secure funding through the BLM's program funding procedures. Final disbursement of Sikes Act Funds shall be made through the Director, BLM, Colorado, after consultation with the Director, DOW.

9) Plans and programs initiated on NRL under the Sikes Act in Colorado shall not conflict with comprehensive plans required of the State under any Federal or State Acts.

10) The BLM and DOW will discuss the following Sikes Act items during the course of their coordination meeting:

   a) HMP priorities for implementation.

   b) Program and budget recommendations for the upcoming and succeeding fiscal years.

   c) A progress report on the current status of HMP implementation.

d) Review of wildlife values produced under existing conservation and rehabilitation programs.

This supplement shall become effective on the date when last signed and shall remain in force until terminated by mutual agreement, by Amendment or abolishment of the Act by Congress, or by either party upon thirty days notice in writing to the other party of its intention to terminate upon a date indicated.

DEPARTMENT OF NATURAL RESOURCES

BY: _____
Harris Sherman, Executive Director

DATE: April 15, 1975

COLORADO DIVISION OF WILDLIFE

BY: _____
Jack R. Grieb, Director

DATE: APR 18 1975

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE

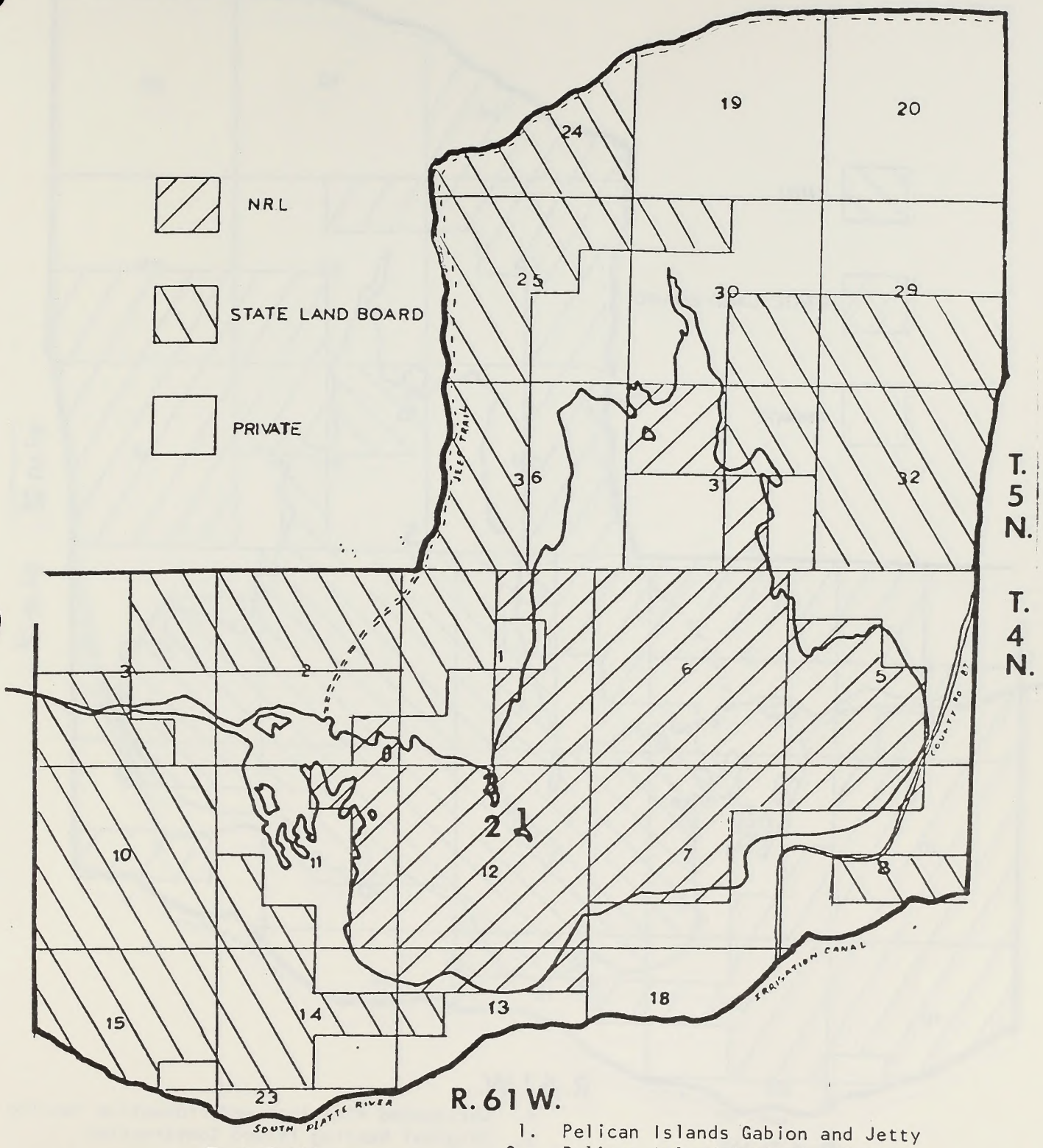
BY: _____
Dale R. Andrus, Director

DATE: 5/6/75

Appendix No. 4

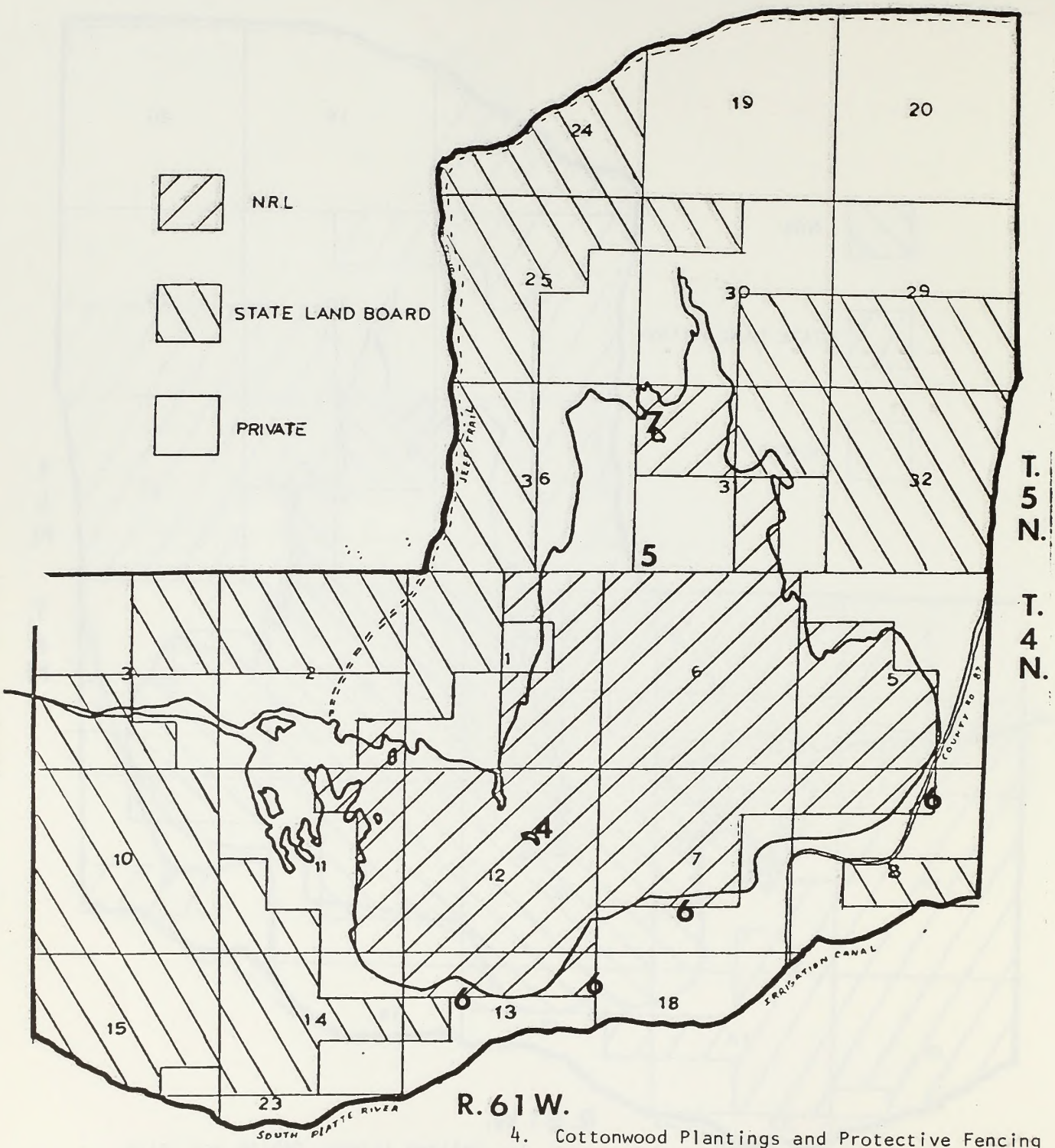
Project Location Maps

PROJECT LOCATION MAPS



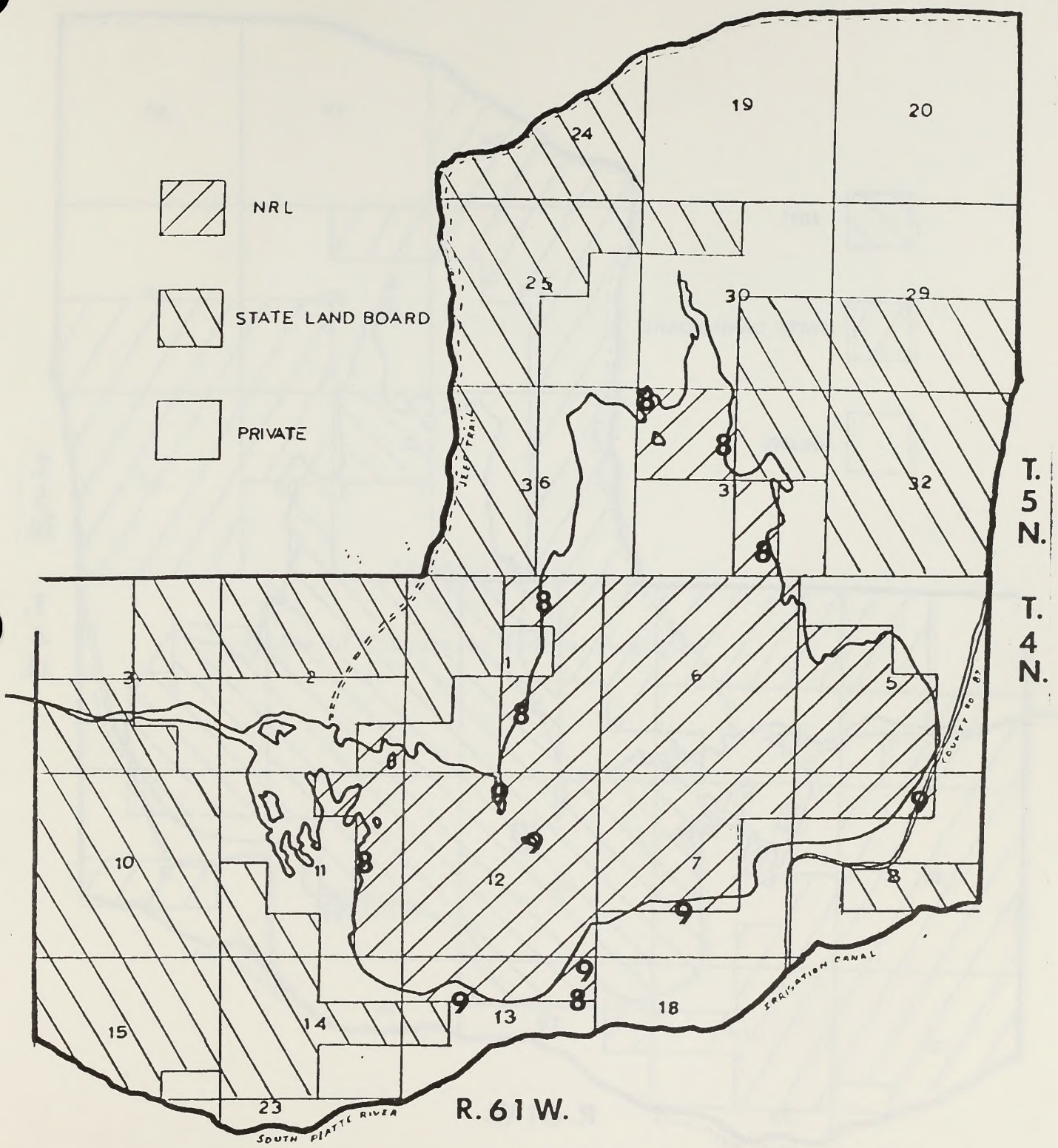
1. Pelican Islands Gabion and Jetty
2. Pelican Island Isolation Project
3. Heron Peninsula Isolation Project

PROJECT LOCATION MAPS



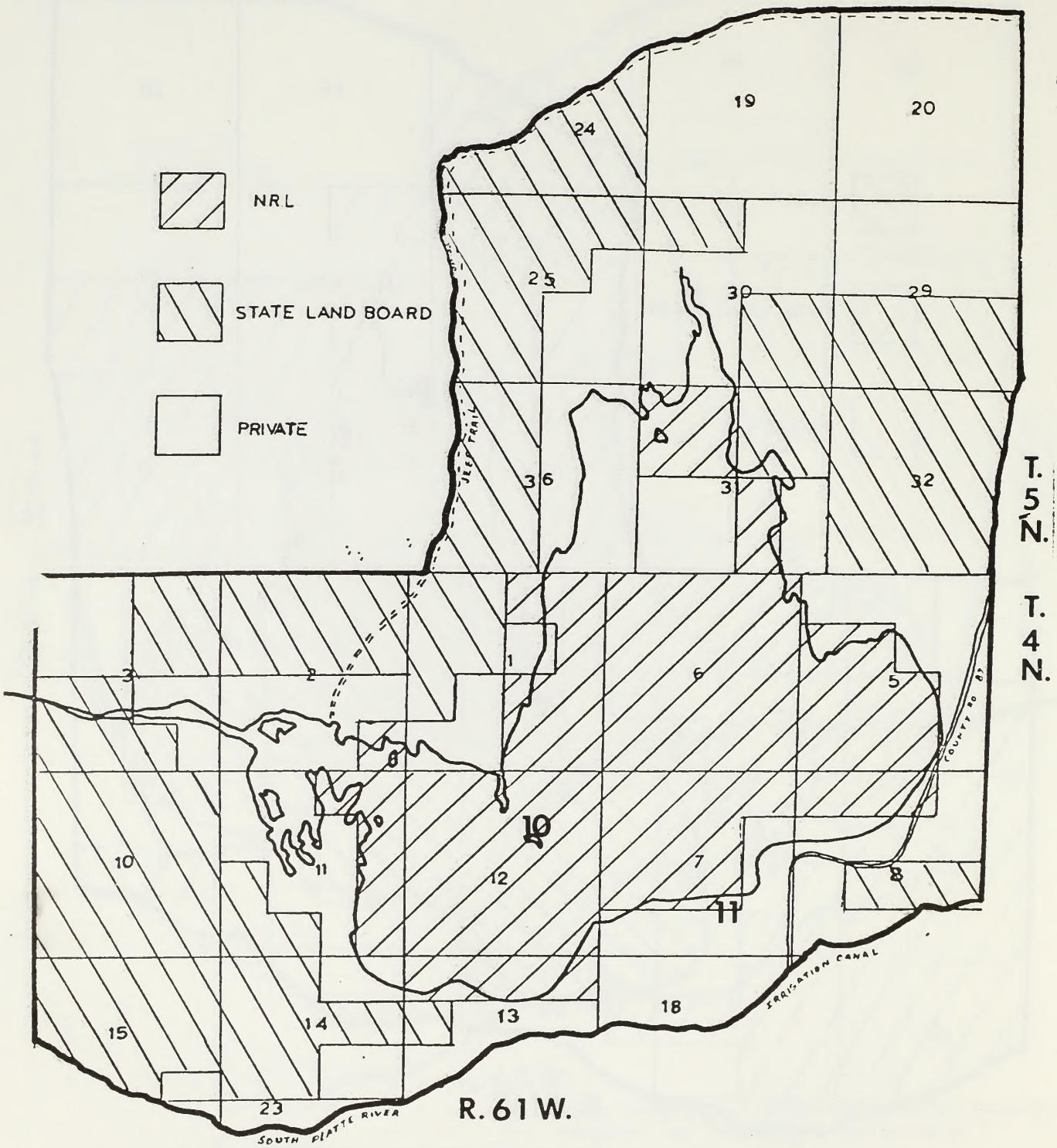
4. Cottonwood Plantings and Protective Fencing
5. Original Nesting Island Construction
6. Wetland Fencing
7. North Island Isolation Project

PROJECT LOCATION MAPS



8. Cottonwood and Willow Plantings
9. Nest Box Placement

PROJECT LOCATION MAPS



10. Vegetation Manipulation
11. Visitors Interpretive Center

Appendix No. 5

Notice of Closure to Federal Register

TO: The Office of the Federal Register
National Archives and Records Service
Washington, D. C. 20408

HIGHLIGHT

Public Lands - Interior proposes to seasonally close certain lands in Colorado to protect critical wildlife habitat.

DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Colorado
(43 U.S.C. 1712)
(43 U.S.C. 1733)

The Bureau of Land Management in Colorado proposes to close the following Public Lands in Weld County to all public use and entry except for authorized personnel from March 15 to October 1 of each year:

T. 4 N., R. 61 W., 6th P.M.
Section 6: All
Section 7: Lots: 1, 2, and 3, $E\frac{1}{2}NW\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}$, $N\frac{1}{2}NE\frac{1}{4}$, $SW\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$ except those lands to be included in the visitors interpretive center, approximately 4 acres

T. 4 N., R. 62 W., 6th P.M.
Section 1: Lot 1, $SE\frac{1}{4}NE\frac{1}{4}$, $SE\frac{1}{4}$
Section 2: $SE\frac{1}{4}SE\frac{1}{4}$
Section 11: $N\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}NE\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$
Section 12: All
Section 13: $N\frac{1}{2}N\frac{1}{2}$

T. 5 N., R. 61 W., 6th P.M.
Section 31: Lots 1 and 2, $E\frac{1}{2}NW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$

The purpose of this closure is to protect critical wildlife habitat as an area of critical environmental concern under authority of Title 43, Sec. 6010.4(C) and (F).

DALE R. ANDRUS
State Director, Colorado

Appendix No. 6

Sign Requisition Form

Form 9130-3
(1971)

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

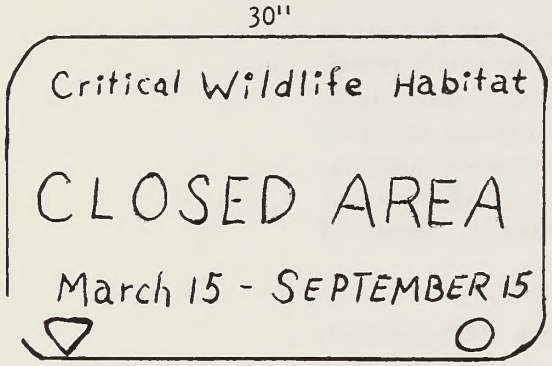
SIGN REQUISITION

7. Sign Description

Signs are to be 18 x 30 inches, of aluminum base material, with painted yellow background and black lettering, large printing - 3" letters; smaller wording - 1½" letters. BLM and Colorado Division of Wildlife emblem sizes to be determined by shop.

1. State: Colorado
2. District: Canon City
3. Requisition No.:
4. Project and/or Sign No.:
5. Benefiting Activity: 4350 (1285)
6. No. Signs to be Made: 36

8. Face of Sign



Colorado Division of Wildlife Emblem

9. Reverse of Sign

10. Site Location: Around public land boundaries at Riverside Reservoir, Weld County, Colorado

11. Road or Trail Designation *(give name and number)*: None

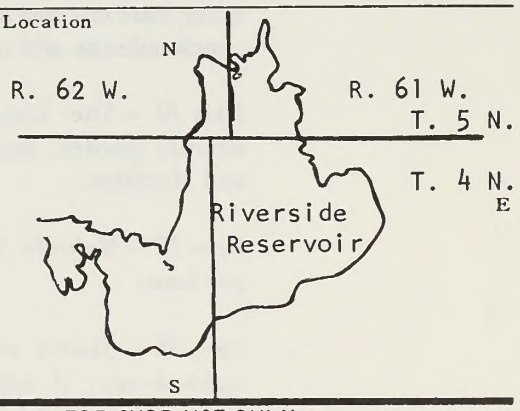
12. Vehicle Speed: N/A

13. Road Surface: N/A

14. Approximate Date to be Erected: September 1978

15. Special Instructions

15. Sketch of Location



FOR SHOP USE ONLY

Date Received	Initials	Shop

Finished Dimensions | Board Feet

Shop Cost | Shipping Costs

Date Finished	Initials	Date Shipped	Initials

17. Requisition Approvals

District	Signature	Date
	Signature	Date

Instructions on reverse

GPO 834-437 (☆ 783-303)

SIGN SHOP

SPECIFIC INSTRUCTIONS

(Items not specified are self-explanatory)

Item 3 – Requisition No. – Begin ordering with No. 1 and number consecutively. Submit separate requisition for *each* sign.

Item 4 – Project and/or Sign No. – For signs ordered in conjunction with approved projects (roads, campgrounds, dams, etc.) use appropriate project number or show best identification. Include district sign plan number.

Item 5 – Benefiting Activity – Show activity number for which sign is to be made.

Item 7 – Sign Description – If standards are not available furnish: (a) size of sign face; (b) materials recommended; (c) style (rustic routed, painted, reflectorized, other); (d) color combinations (white on brown, white on green, other); (e) type and kind of support (masonry, timber base, posts, on trees, other); and (f) new, replacement, or other. Attach additional sheet, if necessary.

Items 8 and 9 – Sketch shape if not BLM standard; indicate wording; size of letters; upper case or upper and lower case; print neatly and exactly what is wanted, using care in composing message, spell correctly; double check mileage and arrow direction.

Item 10 – Site Location – Give sign location to the nearest quarter, quarter of section; and township, range, and Meridian.

Item 12 – Vehicle Speed – Indicate safe speed in miles per hour.

Item 15 – Sketch of Location – Show sight distance, right-of-way, if applicable; and give important natural features such as rock outcrops, heavy brush, timber, etc. which could affect the sign design.

Item 16 – Special Instructions – Specify need for mounting posts. Specify type, size, finish, and hardware. Consider shipping costs.

Item 17 – Requisition Approvals – Initiating district manager must sign, date, and submit all copies *except* Record (yellow) to state office for approval. State office must sign, date, and forward set to sign shop. When sign order is completed sign shop returns request to offices indicated in lower right-hand corner.

Appendix No. 7

Mineral Report

Form 3820–1
(February 1968)
(formerly 4–802)

Serial Number
2311

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

State Colorado

MINERAL REPORT

Report of Mineral Potential

of a Tract of Land

in Riverside Reservoir

(Title)

LANDS INVOLVED

Weld County, Colorado
Sixth Principal Meridian
T. 4 N., R. 62 W.
Sec. 12: SW¼NE¼

April 17, 1974
(Date)

By

James McIntosh

Technical Review

Management Review

GPO 841-153

Introduction

This is an evaluation as to whether an island in Riverside Reservoir located in the SW¼NE¼, Section 12, T. 4 N., R. 62 W., 6th Principal Meridian, Weld County, Colorado is prospectively valuable for minerals.

Conclusion

I conclude the subject land is prospectively valuable for oil and gas but not for any other minerals.

Evaluation

The subject land is located in eastern Colorado in the Denver basin portion of the Great Plains physiographic province.

Underlying the area of the subject land is a Precambrian basement complex, and on top of this complex, late Paleozoic sediments, then Mesozoic sediments, and on top of all, in places a veneer of recent surficial deposits.

Topographically, the area is flat to rolling. The Rocky Mountains rise abruptly from the plains 60 miles to the west.

Not much information is available about the Precambrian basement mentioned in the previous paragraph. Presumably, the complex is igneous and/or metamorphic. The rocks present could be granites or other igneous rocks, schists and gneisses or other metamorphic rocks or a combination of these. It is reasonable that the Precambrian basement under the subject land is the same or similar to the Precambrian rocks exposed in the Front Range to the west. There, as concerns economic mineralization, some but not all areas have been mineralized.

The late Paleozoic sediments mentioned above are Pennsylvanian in age and directly lie above the Precambrian basement. Previous to the deposition of the Pennsylvanian sediments (Fountain formation) the area was generally an upland area which geologists have named Siouxia. At times Siouxia may have been under water but any sediments deposited were later completely eroded.

The Mesozoic sediments also mentioned above are the Permo-Triassic Lykins formation; the Upper Jurassic Sundance and Morrison formations and the Cretaceous Dakota, Benton, Niobrara, Pierre, Fox Hills and Laramie formations.

In the absence of definite knowledge or evidence of mineralizing activity, there is no inference for the occurrence of mineralization related to igneous activity, and one would not reasonably expect magmatic, pneumatolytic, pegmatitic, pyrometasomatic, hydrothermal or similar deposits in the basement complex or overlying sediments of the subject land.

Mineral deposition related to sedimentary processes might be present. Placer deposits cannot be expected since parent vein or other deposits are not present within the distance such metals are usually transported. Lateritic deposits, Lake Superior-type iron formations, high grade carbonate formations, and manganese, phosphate, stratiform-metallic and evaporite formations have not been re ported, so deposits of these types are not to be reasonably expected.

The subject area is outside known coal bearing regions and fields although the coal bearing strata are present. Coal cannot be reasonably expected to be present under the subject land.

Oil and gas might be present in the strata underlying the subject land since proper sediments, reservoirs, and structures are, or might be, present. The Denver Basin is the site of many oil and gas fields. The closest one to the subject land is the Riverside Gas Field about four miles to the northeast, however. Formations suitable for the accumulation of oil and gas are present, but whether other necessary conditions, such as traps, are present is unknown. The presence of oil and gas can only be proved or disproved by drilling. There is not the reasonable expectation of the occurrence of any other type of mineral deposit.

Thus, I believe the subject land is prospectively valuable for oil and gas, but no other minerals.

James M Sutton

Appendix No. 1

Vertebrate Species List

Appendix I

Vertebrate Species List for Riverside Reservoir and Immediate Area 1/

Fish 2/

Clupeidae		
Gizzard shad	(*Dorosoma cepedianum*)	(*) Common
Esocidae		
Northern pike	(*Esox lucius*)	(*) Uncommon
Catostomidae		
White sucker	(*Catostomus commersoni*)	(*) Abundant
Cyprinidae		
Carp	(*Cyprinus carpio*)	(*) Abundant
Creek chub	(*Semotilus atromaculatus*)	(*) Uncommon
Fathead minnow	(*Pimephales promelas*)	(*) Abundant
Ictaluridae		
Channel catfish	(*Ictalurus punctatus*)	(*) Uncommon
Black bullhead	(*Ictalurus melas*)	(*) Common
Cyprinodontidae		
Plains killifish	(*Fundulus kansae*)	(*) Uncommon
Plains topminnow	(*Fundulus sciadicus*)	Uncommon
Centrarchidae		
Largemouth bass	(*Micropterus salmoides*)	Uncommon
Green sunfish	(*Lepomis cyanellus*)	(*) Uncommon
Pumpkinseed	(*Lepomis gibbosus*)	(*) Common

1/ Species inclusion in this check list is a result of either known observations (*) or expected occurrence based upon literature review. These sources are listed following the check list.

2/ Nomenclature from: Bailey, R.M. et al. 1966. A List of Common and Scientific Names of Fishes from the United States and Canada. American Fisheries Soc. Spec. Publ. 6. pp. 1-102.

Fish (Continued)

Centrarchidae (Continued)

Bluegill	(*Lepomis macrochirus*)		Uncommon
White crappie	(*Pomoxis annularis*	(*)	Uncommon
Black Crappie	(*Pomoxis nigromaculatus*)		Uncommon

Percidae

Walleye	(*Stizostedion vitreum*)	(*)	Uncommon
Yellow perch	(*Perca flavescens*)	(*)	Common

Amphibians 3/

Tiger salamander	(Ambystoma tigrinum)	(*) Common
Plains spadefoot toad	(Scaphiopus bombifrons)	Fairly Common
Great Plains toad	(Bufo cognatus)	(*) Common
Woodhouse's toad	(Bufo woodhousei)	(*) Common
Chorus frog	(Pseudacris triseriata)	Fairly Common
Cricket frog	(Acris crepitans)	Uncommon
Leopard frog	(Rana pipiens)	(*) Fairly Common
Bullfrog	(Rana catesbeiana)	Uncommon

Reptiles 3/

Western box turtle	(Terrapene ornata)	Uncommon
Painted turtle	(Chrysemys picta)	(*) Fairly Common
Lesser earless lizard	(Holbrookia maculata)	(*) Fairly Common
Eastern fence lizard	(Scleroporus undulatus)	(*) Common
Short-horned lizard	(Phyrnosoma douglassi)	Uncommon
Great Plains skink	(Eumeces obsoletus)	Uncommon
Many-lined skink	(Eumeces multivirgatus)	(*) Fairly Common
Six-lined racerunner	(Cnemidophorus sexilineatus)	(*) Abundant
Western hognose snake	(Heterodon nasicus)	(*) Common
Eastern yellow-bellied racer	(Coluber constrictor)	Uncommon
Gopher Snake	(Pituophis melanoleucas)	(*) Common
Milk snake	(Lampropeltis triangulum)	Rare
Common garter snake	(Thamnophis sirtalis)	(*) Fairly Common

3/ Nomenclature from Stebbins, Robert C. 1966. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Co., Boston, Mass. 279 pp.

Reptiles (Continued)

Plains garter snake	(Thamnophis radix)	Uncommon
Plains black-headed snake	(Tantilla nigriceps)	Uncommon
Western rattlesnake (Prairie)	(Crotalus viridis)	(*) Uncommon in immediate area

Birds 4/

Order Gaviiformes	
Common loon	(*) Uncommon migrant
Order Podicipediformes	
Western grebe	(*) Common summer resident
Horned grebe	Fairly common migrant
Eared grebe	Common to fairly common summer resident
Pied-billed grebe	Fairly common migrant
Order Pelecaniformes	
White pelican	(*) Abundant - summer nesting resident
Double-crested cormorant	(*) Fairly common summer nesting resident
Order Ciconiiformes	
Great blue heron	(*) Fairly common summer nesting resident
Great egret	(*) Rare - summer resident and migrant
Snowy egret	(*) Common - nesting resident
Cattle egret	(*) Nested in 1977 season
Green heron	(*) Rare migrant and summer resident
Black-crowned night heron	(*) Fairly common summer nesting resident
American bittern	(*) Uncommon - nesting summer resident
White-faced ibis	Uncommon - migrant

4/ Nomenclature from American Ornithologists' Union. 1957. Check-List of North American Birds, 5th ed. American Ornithologists' Union. Baltimore, Md. 691 pp. (Accepted Common Names only used)

Birds (Continued)

Order Anseriformes

Whistling swan		Uncommon migrant
Canada goose	(*)	Abundant - yearlong nesting resident
White - fronted goose		Rare to uncommon migrant
Snow goose		Uncommon migrant
Mallard	(*)	Common to abundant yearlong resident and migrants
Pintail	(*)	Common nesting resident
Gadwall	(*)	Common nesting resident
American wigeon	(*)	Common nesting resident
Northern shoveler	(*)	Fairly common nesting resident
Blue-winged teal	(*)	Common to abundant nesting summer resident and migrant
Cinnamon teal	(*)	Fairly common summer resident
American green-winged teal	(*)	Common nesting resident
Redhead	(*)	Fairly common nesting resident
Canvasback	(*)	Uncommon spring and fall migrant and winter resident
Ring-necked duck		Uncommon winter resident
Lesser scaup	(*)	Common winter resident
Common goldeneye		Common winter resident
Bufflehead	(*)	Common winter resident
Ruddy duck	(*)	Fairly common summer resident and migrant
Common merganser	(*)	Common winter resident
Hooded merganser		Rare winter resident
Red-breasted merganser		Uncommon migrant

Birds (Continued)

Order Falconiformes		
Turkey vulture		Uncommon summer resident
Goshawk		Uncommon migrant
Cooper's hawk		Uncommon summer resident
Sharp-shinned hawk		Uncommon yearlong resident
Marsh hawk	(*)	Fairly common yearlong resident
Rough-legged hawk	(*)	Common winter resident
Ferruginous hawk	(*)	Fairly common summer resident
Red-tailed hawk	(*)	Fairly common summer resident
Swainson's hawk	(*)	Fairly common summer resident
Golden eagle	(*)	Uncommon yearlong resident
Bald eagle	(*)	Fairly common winter resident
Osprey	(*)	Uncommon migrant
Prairie falcon	(*)	Uncommon yearlong resident
Peregrine falcon		Rare migrant
Merlin		Uncommon migrant and winter resident
American kestrel	(*)	Common yearlong nesting resident
Order Galliformes		
Bobwhite	(*)	Uncommon yearlong resident
Ring-necked pheasant	(*)	Fairly common yearlong resident
Order Gruiformes		
Sora		Uncommon summer resident
Virginia rail		Uncommon summer resident
American coot	(*)	Fairly common summer resident
Sandhill crane	(*)	Uncommon migrant

Birds (Continued)

Order Charadiiformes

American avocet	(*)	Fairly common summer nesting resident
Black-necked stilt	(*)	Uncommon migrant
Mountain plover		Fairly common summer resident
American golden plover		Rare migrant
Semipalmated plover		Uncommon to fairly common migrant
Killdeer	(*)	Abundant summer resident
Black-bellied plover	(*)	Rare to uncommon migrant
Long-billed curlew	(*)	Uncommon migrant
Whimbrel		Rare migrant
Marbled godwit		Fairly common migrant
Upland sandpiper	(*)	Uncommon summer resident
Solitary sandpiper		Fairly common migrant
Spotted sandpiper	(*)	Fairly common summer resident
Willet		Uncommon summer resident
Greater yellowlegs		Fairly common migrant
Lesser yellowlegs		Fairly common migrant
Red knot		Rare migrant
Stilt sandpiper		Uncommon migrant
Long-billed dowitcher	(*)	Fairly common migrant
Pectoral sandpiper		Uncommon migrant
Sanderling		Uncommon migrant
Baird's sandpiper	(*)	Abundant migrant
Least sandpiper	(*)	Common migrant
White-rumped sandpiper		Rare migrant

Birds (Continued)

Semipalmated sandpiper		Fairly common migrant
Western sandpiper		Fairly common migrant
Wilson's phalarope	(*)	Fairly common summer resident,abundant migrant
Northern phalarope		Uncommon migrant
Common snipe		Fairly common yearlong resident
Glaucous gull		Uncommon winter resident
Herring gull	(*)	Fairly common winter resident
California gull	(*)	Common summer nesting resident
Ring-billed gull		Fairly common year long resident
Franklin's gull	(*)	Fairly common summer resident and migrant
Bonaparte's gull		Uncommon migrant
Forster's tern		Uncommon summer resident
Black tern		Uncommon summer resident
Order Columbiformes		
Rock dove	(*)	Common yearlong resident
Mourning dove	(*)	Abundant summer nesting resident
Order Cuciliformes		
Yellow-billed cuckoo		Uncommon summer resident
Order Strigiformes		
Great-horned owl	(*)	Fairly common nesting yearlong resident
Short-eared owl		Uncommon yearlong resident
Long-eared owl		Uncommon yearlong resident
Barn owl	(*)	Rare yearlong resident
Snowy owl		Rare winter resident
Screech owl	(*)	Uncommon yearlong resident

Birds (Continued)

Order Caprimulgiformes		
Common nighthawk	(*)	Fairly common summer resident
Poor-will		Uncommon summer resident
Order Apodiformes		
Black swift		Uncommon migrant
Order Coraciiformes		
Belted kingfisher		Fairly common yearlong resident
Order Piciformes		
Common flicker	(*)	Common yearlong resident
Red-headed woodpecker	(*)	Undetermined
Yellow-bellied sapsucker	(*)	Uncommon migrant
Hairy woodpecker	(*)	Fairly common yearlong resident
Downy woodpecker		Fairly common yearlong resident
Order Passeriformes		
Eastern kingbird	(*)	Fairly common summer resident
Western kingbird	(*)	Common summer resident
Ash-throated flycatcher		Fairly common summer resident
Says phoebe		Fairly common summer resident
Western wood pewee		Fairly common summer resident
Olive-sided flycatcher		Fairly common migrant
Horned lark	(*)	Abundant yearlong resident
Barn swallow	(*)	Common summer resident
Cliff swallow	(*)	Common summer resident
Violet-green swallow		Common migrant
Tree swallow		Common summer resident
Bank swallow		Fairly common summer resident
Rough-winged swallow		Fairly common summer resident

Birds (Continued)

Blue jay	(*)	Uncommon yearlong resident
Black-billed magpie	(*)	Common to abundant yearlong nesting resident
Common raven	(*)	Fairly common yearlong resident
Common crow	(*)	Common yearlong resident
Black-capped chickadee	(*)	Fairly common yearlong resident
Mountain chickadee	(*)	Fairly common winter resident
White-breasted nuthatch		Fairly common winter resident
Red-breasted nuthatch		Uncommon migrant
Brown creeper		Uncommon winter resident
House wren	(*)	Fairly common summer resident
Bewick's wren		Uncommon migrant
Long-billed marsh wren		Uncommon summer resident
Gray catbird		Fairly common summer resident
Brown thrasher	(*)	Fairly common summer resident
American robin	(*)	Abundant yearlong resident
Hermit thrush		Fairly common migrant
Swainson's thrush		Fairly common migrant
Veery		Uncommon migrant
Eastern bluebird		Uncommon yearlong resident and migrants
Western bluebird		Uncommon migrant
Blue-gray gnatcatcher		Uncommon migrant
Golden-crowned kinglet		Uncommon winter resident
Ruby-crowned kinglet		Uncommon migrant
Water pipit		Common migrant
Bohemian waxwing		Irregular winter resident

Birds (Continued)

Cedar waxwing		Irregular migrant or winter resident
Northern shrike		Uncommon winter resident
Loggerhead shrike	(*)	Fairly common to common summer resident
Starling	(*)	Abundant yearlong resident
Red-eyed vireo		Uncommon summer resident
Warbling vireo		Fairly common summer resident
Black and white warbler		Rare migrant
Orange-crowned warbler	(*)	Common migrant
Virginia's warbler		Fairly common migrant
Yellow warbler		Common summer resident
Yellow-rumped warbler		Common migrant
Northern waterthrush		Uncommon migrant
Common yellowthroat		Fairly common summer resident
Yellow-breasted chat		Uncommon summer resident
McGillivray's warbler	(*)	Fairly common migrant
Wilson's warbler		Fairly common migrant
American redstart		Uncommon migrant
House sparrow	(*)	Abundant yearlong resident
Bobolink		Rare migrant
Western meadowlark	(*)	Abundant migrant
Yellow-headed blackbird	(*)	Common summer nesting resident
Red-winged blackbird	(*)	Abundant summer nesting resident
Brewer's blackbird	(*)	Common yearlong resident
Brown-headed cowbird		Fairly common summer resident
Northern oriole	(*)	Fairly common summer resident
Orchard oriole		Uncommon summer resident

Birds (Continued)

Evening grosbeak		Fairly common migrant
Blue grosbeak		Uncommon summer resident
Black-headed grosbeak		Uncommon migrant
Lazuli bunting		Undetermined migrant
House finch		Common yearlong resident
Gray-crowned rosy finch		Uncommon winter resident
Pine siskin		Fairly common winter resident
Common redpoll		Irregular winter resident
American goldfinch		Fairly common yearlong resident
Lesser goldfinch		Uncommon summer resident
Dickcissel		Irregular summer resident
Rufous-sided towhee		Fairly common migrant
Green-tailed towhee		Fairly common migrant
Savannah sparrow		Fairly common summer resident
Grasshopper sparrow		Uncommon summer resident
Baird's sparrow		Rare migrant
Lark bunting	(*)	Common summer resident
Vesper sparrow		Fairly common summer resident
Lark sparrow	(*)	Fairly common summer resident
Cassin's sparrow		Fairly common summer resident
Dark-eyed junco	(*)	Common winter resident
Tree sparrow		Common winter resident
Chipping sparrow		Fairly common summer resident
Clay-colored sparrow		Fairly common migrant
Brewer's sparrow		Common summer resident
Harris' sparrow		Uncommon winter resident

Birds (Continued)

White-throated sparrow		Uncommon winter resident
White-crowned sparrow	(*)	Common winter resident
Lincoln's sparrow		Fairly common migrant
Song sparrow		Fairly common yearlong resident
McCowan's longspur		Common summer resident
Chestnut-collared longspur		Fairly common summer resident
Lapland longspur		Irregular winter resident
Snow bunting		Rare winter resident

Mammals

Order Insectivora			
Least shrew	(*Cryptotis parva*)		Fairly common
Eastern mole	(*Scalopus aquaticus*)		Rare
Order Chiroptera			
Small-footed myotis	(*Myotis leibii*)		Undetermined
Silver-haired bat	(*Lasionycteris noctivagans*)		Undetermined
Big brown bat	(*Eptesicus fuscus*)		Undetermined
Red bat	(*Lasiurus borealis*)		Undetermined
Order Lagomorpha			
Eastern cottontail	(*Sylvilagus floridanus*)	(*)	Common
Desert cottontail	(*Sylvilagus audubonii*)	(*)	Common
White-tailed jackrabbit	(*Lepus townsendii*)	(*)	Uncommon
Black-tailed jackrabbit	(*Lepus californicus*)	(*)	Common
Order Rodentia			
Thirteen-lined ground squirrel	(*Spermophilus tridecemlineatus*)	(*)	Common
Spotted ground squirrel	(*Spermophilus spilosoma*)	(*)	Uncommon

Mammals (Continued)

Black-tailed prairie dog	(Cynomys ludovicianus)		Historically present
Fox squirrel	(Sciurus niger)	(*)	Common in riparian woodlands
Plains pocket gopher	(Geomys bursarius)		Abundant
Olive-backed pocket mouse	(Perognathus fasciatus)		Rare
Plains pocket mouse	(Perognathus flavescens)		Fairly common
Silky pocket mouse	(Perognathus flavus		Uncommon
Hispid pocket mouse	(Perognathus hispidus)		Fairly common
Ord's kangaroo rat	(Dipodomys ordii)		Common to abundant
Beaver	(Castor canadensis)	(*)	Fairly common along South Platte River
Plains harvest mouse	(Reithrodontomys montanus)		Uncommon
Western harvest mouse	(Reithrodontomys megalotis)		Fairly common
Deer mouse	(Peromyscus maniculatus	(*)	Abundant
Northern grasshopper mouse	(Onychomys leucogaster)	(*)	Abundant
Meadow vole	(Microtus pennsylvanicus)		Common
Prairie vole	(Microtus ochrogaster)		Fairly common
Muskrat	(Ondatra zibethicus)	(*)	Common

Order Carnivora

Coyote	(Canis latrans)	(*)	Common to abundant
Red fox	(Vulpes vulpes)	(*)	Common to abundant
Swift fox	(Vulpes velox)	(*)	Uncommon
Racoon	(Procyon lotor)	(*)	Common
Long-tailed weasel	(Mustela frenata)		Uncommon
Badger	(Taxidea taxus)		Fairly common
Spotted skunk	(Spilogale putorius)		Uncommon
Striped skunk	(Mephitis mephitis)		Common

Mammals (Continued)

Order Artiodactyla

Mule deer	(Odocoileus hemionius)		Common riparian woodlands
White-tailed deer	(Odocoileus virginianus)		Uncommon riparian woodlands
Pronghorn antelope	(Antilocapra americana)	(*)	Fairly common

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